IN RE:

Administrative Filing of the Medical Treatment Protocols of the
Medical Advisory Board of the
Rhode Island Workers' Compensation Court

In accordance with the applicable statutes, in the State of Rhode Island, relating to Administrative Procedures, the attached Protocols and Standards for Treatment for Compensable Injuries (hereinafter referred to as "Protocols and Standards"), as promulgated by the Medical Advisory Board for the Workers' Compensation Court, in accordance with R.I.G.L. §28-30-22 and formally approved and adopted by the Chief Judge of the Workers' Compensation Court, are heretofore presented and filed with the office of the Rhode Island Secretary of State.

It is of the utmost importance, however, that it be noted that these Protocols and Standards are filed out of an abundance of caution and in strict adherence to the Rhode Island Administrative Procedures Act, so-called, as set forth in R.I.G.L. §42-35-1 et seq. The Protocols and Standards are in no way intended to be, nor are they to be used as a binding rule or regulation. These Protocols and Standards are intended to outline options of appropriate methods and types of intervention to be utilized by physicians and other healthcare providers for what is believed to be some of the most frequent work-related injuries seen in Rhode Island.

It is in this spirit that these Protocols and Standards are to be used, and no other purpose or reason is intended.

STATE OF RHODE ISLAND
WORKERS' COMPENSATION COURT
MEDICAL ADVISORY BOARD

P R O T O C O L S

Approved by the Medical Advisory Board
Rhode Island Workers' Compensation Court

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PREFACE

The Medical Advisory Board of the Workers' Compensation Court has developed treatment protocols for some of the most frequent work-related injuries seen in Rhode Island. It is important that the medical community understand the purpose of establishing these protocols, that is, to ensure the provision of quality medical care for all injured workers, while limiting costly, inappropriate intervention and unnecessary delay in returning workers to gainful employment.

The medical protocols were not designed as "cookbooks" of care, rather, they outline options of appropriate methods and types of intervention from which physicians and other providers are to choose. Limitation by practice or procedure is not, however, intended to reflect the opinion of the Medical Advisory Board that a particular area of practice or individual physician within an area of practice is not competent to perform a procedure, conduct a diagnostic test, or perform other services. Rather, any such limitations set forth in these protocols have been developed, and will be reviewed, to address issues within the Workers' Compensation system. Although primarily geared toward the entry-level physician, i.e, the first treating physician, these protocols offer important information for all physicians and health care providers.

These multidisciplinary protocols note anticipated time for the resolution of the injury and the time-frame for further medical interventions. The Medical Advisory Board is well aware that resolution of the injury may be affected by many factors, such as patient age, co-morbidity, etc. All treating medical providers are expected to follow the spirit of these guidelines. All cases which exceed the anticipated time frames will be reviewed by the Board.

In particular, rehabilitation intervention is geared toward the same time-frames for treatment. However, these time guidelines are based on the early referral of appropriate patients into therapy. The time guidelines may need to be extended when the onset of rehabilitation is delayed. Still important, though, is the health care provider's understanding that intervention should be as time-limited as is safe and feasible and that all treatments are geared toward improving objectively measured physical and work skill deficits.

A particular treatment option, not specifically mentioned in most of the protocols, is that of early referral for psychiatric or psychological evaluation. If the treating physician is concerned that psychosocial issues, such as marital problems, alcohol, or drug abuse, etc., are delaying the worker's return to work, a referral to treatment resources is an appropriate action. Referral may also be indicated for individuals with history of prior psychiatric treatment or those reporting anxiety or depression as a major symptom of the work injury.

Lastly, the effort to establish these protocols has been shared by many dedicated professionals. The Medical Advisory Board welcomes and appreciates feedback from all of the medical community of Rhode Island.

Revision Passed: 6/9/98
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CARPAL TUNNEL SYNDROME

I. BACKGROUND

Carpal tunnel syndrome, also known as tardy median nerve palsy, is believed to be caused by local impairment of the median nerve at the carpal canal in the wrist secondary to narrowing or crowding of the nerve in the carpal tunnel. The condition may have multiple causes including 1) space-occupying lesions such as the residual of a wrist fracture, infections, local edema, tumors, flexor tenosynovitis (non-specific as well as that associated with rheumatoid arthritis), foreign bodies, or aberrant muscles; 2) systemic conditions such as pregnancy, obesity, diabetes mellitus, thyroid dysfunction, arthritis, or amyloidosis; 3) overuse of hand and wrist, work-related trauma and repetitive movements, constricting bandages around the wrist, or improper postural habits regarding the wrist joint; or 4) it may have a spontaneous or idiopathic onset. The condition can occur at any age but is most often encountered in patients over 30 years in age. It occurs three to five times more frequently in women than men.

II. DIAGNOSTIC CRITERIA

A. Pertinent Historical and Physical Findings

Patients complain of paresthesias and numbness in all or part of the sensory distribution pattern of the median nerve in the hand, which often worsen at night when lying in bed. These sensations are occasionally associated with pain that may radiate proximally to the shoulder area. The most characteristic history involves nocturnal paresthesias, described frequently as sensations of burning or numbness that may be relieved by shaking or holding the affected arm in the dependent position. Weakness of grip, hypohydrosis, clumsiness and proximal pain migration may be accompanying complaints. Wrist palmar flexion may aggravate the symptoms, and the patient may note difficulty manipulating small objects. Occasionally, patients may complain of circulatory disturbances in the fingers.

Symptoms may be reproduced by hand and wrist motions, such as forced flexion and extension of the wrist, that constrict the carpal canal. This tendency forms the physiologic basis for the Phalen Test, which may be positive in the presence of median nerve compression at the wrist. The patient may exhibit dryness of the skin on the hand and fingers, thenar muscle atrophy or fasciculations, and decreased pinch or grip strength. There may be increased median nerve two-point discrimination. Tinel's sign may be positive. These tests are strongly corroborative, but their absence does not exclude this diagnosis.

B. Appropriate Diagnostic Tests and Examinations

1. Radiographs of wrist

2. Electromyogram and nerve conduction studies

3. Hematologic, serologic, and endocrinologic studies if symptoms suggest an underlying systemic disease

4. Response to steroid injection into carpal canal

5. Anteroposterior and lateral oblique radiographs of cervical spine if symptoms suggest origin in the cervical spine

6. Chest radiograph, if there is concern about brachial plexus or apex of lung

C. Supporting Evidence

The electromyograph and nerve conduction tests are helpful when positive but can be negative in some patients with this disorder. They are useful in atypical patients or in patients in whom secondary gain may be a motive. The most difficult differentiation involves patients with diabetes mellitus and suspected carpal tunnel syndrome. Some patients with neuropathies may be difficult to assess. Electrodiagnostic studies may facilitate the assessment of patients with both neuropathy and suspected carpal tunnel syndrome. In patients with suspected double-crush

syndrome, electrodiagnostic tests may be helpful in determining the relative contributions of each site of compression.

III. TREATMENT

A. Outpatient Treatment

1. Nonoperative treatment - Treatment time limited to 3 to 6 weeks, provided all appropriate conservative measures have been assessed.

a. Indications
1) Mild symptoms
2) Pregnancy
3) If constricting bindings or positional abnormalities are causative

b. Treatment Options
1) Neutral position wrist splint, especially at night
2) Steroid injections
3) Nonsteroidal anti-inflammatory drugs
4) Activity modification
5) Treatment of underlying systemic disease
6) Removal of constricting bindings or bandages

c. Rehabilitation
1) Hand and wrist exercises
2) Grip strengthening exercises
3) Modification of activities of daily living and/or job tasks

d. Supporting evidence consists of favorable response to steroid injections and to the use of a wrist splint in the absence of objective evidence of denervation.

2. Ambulatory Surgery

a. Indications
1) Failure to respond to nonoperative treatment
2) Presence of thenar atrophy or weakness or significant hyperesthesia/dysesthesia (especially with objective impairment of sensibility as determined by two-point discrimination or by light touch)
3) Progressive symptoms
4) Presence of space-occupying lesion in carpal canal

b. Treatment Options
1) Release of transverse carpal ligament, either under local or regional block

c. Rehabilitation
1) Elevation of hand and exercise of fingers and shoulder
2) Wrist splint in position of slight extension for two to three weeks postoperatively

B. Estimated Duration of Care

1. Nonoperative treatment - maximal medical improvement
2. Operative treatment - three to six weeks following surgery.

PROTOCOL HISTORY:
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Effective: 6/27/2006

CERVICAL MUSCULOLIGAMENTOUS INJURY (Sprain/Strain)

I. BACKGROUND

These injuries may occur on the job, including operation of a motor vehicle as it relates to the patient's employment. Symptoms are believed to be related to a partial stretching or tearing of the soft tissues (muscles, fascia, ligaments, facet joint capsule, etc.). This may be associated, in addition to the neck pain, with vague upper extremity complaints. The recovery period is of variable duration, but generally is less than three or four weeks.

II. DIAGNOSTIC CRITERIA

A. Pertinent Historical and Physical Findings

The onset of neck pain and paraspinal muscle spasm begins either suddenly after the injury occurs or develops gradually over the next 24 hours. This pain is usually aggravated by motion of the neck and/or shoulder and frequently relieved by rest. The pain usually does not radiate below the shoulder. It can be accompanied by paresthesia or a sense of weakness in the upper extremities related to the muscle spasm in the neck. Physical findings include tenderness to palpation, spasm of the paravertebral muscles and aggravation of the pain with motion. Neurological examination and nerve root stretch tests are usually negative.

B. Appropriate Diagnostic Tests and Examinations

In general, anteroposterior, lateral, oblique, flexion and extension x-rays of the cervical spine and open mouth view to visualize the odontoid process are appropriate. Other x-rays may be added to the roentgenographic series as indicated. Straightening of the cervical spine is frequently observed on the lateral x-ray.

C. Inappropriate Diagnostic Tests and Examinations during the acute phase of the first 4 weeks.

1. CT Scan
2. MRI
3. Bone Scan
4. Myelography
5. EMG in the absence of abnormal neurologic findings
6. Thermogram *
7. Evoked Potentials

III. TREATMENT

A. Outpatient Treatment

1. Non-operative Treatment

a. Indications: Almost all patients with cervical musculoligamentous (sprain/strain) can be treated satisfactorily. No indications exist for the use of surgery in the treatment of cervical musculoligamentous injury.

b. Treatment Options

1) Pain medication, non-narcotic
2) Muscle relaxants
3) Anti-inflammatory drugs, non-steroidal
4) Physical therapy and/or rehabilitative services*
5) Occasional trigger point injections may be helpful

c. Rehabilitation Procedures

1) Therapy may be initiated as early as the day of injury; indications for and focus of (early) intervention include:

* Never appropriate

a. acute management of pain/spasms;
b. limited use of passive modalities, except unlimited ice;
c. instruction in ROM/stretching exercises for neck/shoulder muscles;
d. assessment of return to work readiness and identifying necessary work modifications;
e. patient education in healing process and body mechanics;

Time Frame: May range from one visit only to ½ to 2 hours per day.

2. Inappropriate Treatments: Exclusive use of passive (palliative) modalities; TENS is not indicated.
Cervical traction is generally not indicated.

3. For the (smaller) portion of workers, some may have unique job requirements necessitating a change in work duties or work skills retraining.

B. Inappropriate Treatment

1. Operative treatment is inappropriate for a cervical strain
2. Narcotic medication for a prolonged period of time
3. Inpatient treatment

C. Estimated Duration of Care: 1 to 4 weeks

D. Anticipated Outcome

1) Resumption of normal activity without residual symptoms in most cases

E. Modifiers (age, sex, and co-morbidity)

Co-morbidity (e.g. degenerative disk disease, spondylolisthesis, segmental instability, osteoporosis, spine deformity) may be associated with a higher incidence of persistent symptoms.

IV. If the patient has not responded to the above-outlined treatments in four weeks time, the patient must be referred to a Neurologist, Neurosurgeon, Orthopedic Surgeon, or Physiatrist. The specialist referred to above may order further diagnostic procedures, since the failure to respond to conservative treatment brings with it the distinct

possibility of a different diagnosis such as a cervical disk.

NOTE: Cervical Musculoligamentous Injury (Sprain/Strain) will also include BACK SPASM, BACK SPRAIN, SUBLUXATIONS, FACET ARTHROPATHY, SPONDYLOLISTHESIS WITH NO NEUROLOGICAL INVOLVEMENT, HERNIATED INTERVERTEBRAL DISK WITH NO NEUROLOGICAL INVOLVEMENT, ANNULAR TEARS, MYOFASCIAL PAIN, SPINAL STENOSIS.

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HERNIATED CERVICAL DISK

Patients under treatment by their own physician who fail to improve after four weeks - refer to a Neurologist, Orthopedic Surgeon, Physiatrist, or Neurosurgeon for consultation and/or treatment.

I. BACKGROUND

A herniated cervical disk is a condition in which there is a protrusion of the intervertebral disk. Herniations occur most commonly through a posterolateral defect, but midline herniations may occur as well. Resulting compression of the spinal nerve root causes pain and paresthesia usually along the anatomic course of the affected nerve root. In the cervical spine, this most often occurs at the C5-6 or the C6-7 disk levels, causing pressure on the corresponding C6 and C7 nerve roots. On infrequent occasion, disk herniation or a spondylitic process can cause compression of the cervical spinal cord. This condition may then be associated with sensory or motor dysfunction in the lower extremities and bladder and/or bowel symptoms.

II. DIAGNOSTIC CRITERIA

A. Pertinent Historical and Physical Findings

Neck pain is usually the first symptom and may be subsequently associated with scapular pain, upper extremity pain or paresthesia. Neck motions are frequently limited and cause an exacerbation of pain.

The neurological exam may be normal if the compressed nerve is still functional or there may be objective evidence of nerve dysfunction (atrophy, weakness, sensory alteration or altered reflex) depending upon the anatomic nerve root affected.

B. Appropriate Diagnostic Test and Examinations – Suggested Sequence After Appropriate Referral Has Been Made
(Neurologist, Neurosurgeon, Orthopedic Surgeon, or Physiatrist).

III. DIAGNOSTIC PROCEDURES

A. Plain Radiographs of the spine may be useful to rule out other conditions such as tumor, infection, fracture, congenital anomalities, and as a baseline for alignment, curvature, subluxation (flexion-extension), etc.

B. MRI is the gold standard for evaluation of the cervical spine, both bone quality and soft tissue disease. Specific contraindications for MRI are presence of metal in retina, aneurysm clip, pacemaker for heart or deep brain electrodes. Patients with anxiety may require an open MRI to avoid panic attacks.

C. Myelography is rarely indicated, and may be done with CT Scan directly following to evaluate a root compression that is equivocal on MRI. It should never be used as a primary study. This is an outpatient procedure.

D. CT may be helpful if no MRI is available but gives less information. CT may be useful in some instances where there is a specific level or bone problem that may be better delineated.

E. EMG and NCV may be indicated to sort out specific radiculopathy or conduction questions. This is not a general screening test. Rarely evoked potentials may be indicated if spinal cord problems exist. These are best ordered by a neurologist. EMG should not be ordered before four weeks following the onset of symptoms.

F. Inappropriate Diagnostic Tests

Thermography
Spinoscopy
Myeloscopy
Dermatomal Somatosensory Evoked Potential

IV. TREATMENT

A. Non Operative Treatment

1. Use of analgesics, anti-inflammatory medication. Avoid narcotics other than brief use only, for acute pain.

2. Intermittent traction, soft collar, heat and massage may relieve acute symptoms. Treatment longer than 2 weeks has little efficacy. Traction may be done at home, over a door, using 7-10 pounds weight for 15-20 minutes twice daily.

3. Limited bed rest may be valuable, not for more than 2-3 days on average.

4. It is important to note that physical therapy per se is generally not indicated in acute radiculopathy. The vast majority of root symptoms resolve in weeks with only anti-inflammatory medication. If neurologic signs, (particularly weakness, bowel-bladder abnormality, etc.) or significant pain are present, an early MRI is indicated, and further therapy will be guided by the findings.

V. HOSPITAL ADMISSION

A. Non-Operative. Very few indications

1. Inability to control pain as outpatient.

2. Need for urgent MRI Scan with likelihood of surgery to follow.

B. Operative Treatment. Represents failure of conservative measures, or progression of neurologic deficit. Diagnosis should be confirmed by objective testing.

1. Laminectomy, laminotomy, foraminotomy may be done for root or cord compression.

2. Anterior disk resection and interbody fusion (auto graft, iliac crest or cadaver bone). A plate may be used to give additional stability for multi-level interbody fusions or corpectomy.

3. Posterior cervical fusion may be required for instability at one (eg. C1-C2) or several levels, with or without laminectomy. Hardware and graft bone may be required for these procedures.

Indications for discharge are absence of fever, significant swallowing problems, inability to void, presence of neurologic or wound complications, or infection.

Generally with an uncomplicated ACDF procedure patients can go home the morning after surgery. Extended anterior procedures or laminectomy will require 2-3 days.

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PROTOCOLS FOR INJURIES TO THE EYE

CORNEAL ABRASION

I. Background

A corneal abrasion is usually caused by a foreign body or other object striking the eye. This results in a disruption of the corneal epithelium.

II. Diagnostic Criteria

A. Pertinent History and Physical Findings

Patients complain of pain and blurred vision. Photophobia may also be present. Symptoms may not occur for several hours following an injury.

B. Appropriate Diagnostic Tests and Examinations

Comprehensive examination by an ophthalmologist to rule out a foreign body under the lids, embedded in the cornea or sclera, or penetrating into the eye. The comprehensive examination should include a determination of visual acuity, a slit lamp examination and a dilated fundus examination when indicated.

III. Treatment

A. Outpatient Treatment

Topical antibiotics, cycloplegics, and pressure patch at the discretion of the physician. Analgesics may be indicated for severe pain.

B. Duration of Treatment

May require daily visits until cornea sufficiently healed, usually within twenty-four to seventy-two hours but may be longer with more extensive injuries. In uncomplicated cases, return to work anticipated within one to two days. The duration of disability may be longer if significant iritis is present.

IV. Anticipated Outcome

Full recovery.

CORNEAL FOREIGN BODY

I. Background

A corneal foreign body most often occurs when striking metal on metal or striking stone. Auto body workers and machinists are the greatest risk for a corneal foreign body. Hot metal may perforate the cornea and enter the eye. Foreign bodies may be contaminated and pose a risk for corneal ulcers.

II. Diagnostic Criteria

A. Pertinent History and Physical Findings

The onset of pain occurs either immediately after the injury or within the first twenty-four hours. Typically there is a sensation of something in the eye, pain, and photophobia. The pain is aggravated by blinking or moving the eye. Vision may be affected if the foreign body is in the visual axis.

B. Appropriate Diagnostic Tests and Examinations

A comprehensive examination by an ophthalmologist is necessary, including determination of visual acuity, slit lamp and dilated fundus examination to rule out intraocular foreign bodies. An orbital x-ray or CT scan may be indicated if there is a suspicion of ocular or orbital penetration.

III. Treatment

A. Outpatient Treatment

Superficial or embedded corneal foreign bodies are usually removed at the slit lamp in the emergency room or ophthalmologist's office. Topical antibiotics, cycloplegics, and pressure patch are used at the discretion of the physician. Analgesics, including narcotics may be necessary for the first several days. Daily visits may be necessary until the cornea is healed.

B. Estimated Duration of Care

Return to work anticipated within one to two days in uncomplicated cases.

C. Anticipated Outcome

Full recovery unless the foreign body leaves a significant scar in the visual axis. This may result in diminished visual acuity or may require spectacles, a contact lens, or corneal surgery to improve the vision.

HYPHEMA

I. Background

Hyphema is bleeding within the anterior chamber of the eye. It is typically caused by severe blunt trauma to the eye rupturing intraocular blood vessels. Hyphema may be associated with disruption of the trabecular meshwork and lead to angle recession glaucoma. Elevated intraocular pressure with hyphema may cause blood staining of the cornea. Hyphema in patients with sickle cell anemia also poses significant risk to vision. The most significant risk with hyphema is rebleeding which will occur in up to 30% of cases within the third to fifth day. Rebleeding may cause marked elevation of intraocular pressure, as well as corneal blood

staining and visual loss. Late complications may include angle-recession glaucoma and cataract.

II. Diagnostic Criteria

A. Pertinent History and Physical Findings

Hyphema generally occurs after severe blunt trauma to the eye. It can range from red blood cells visible within the anterior chamber to a layered clot filling the entire anterior chamber. Intraocular pressure is often elevated.

B. Appropriate Diagnostic Tests and Examinations

This is an ocular emergency and requires immediate referral to an ophthalmologist. Appropriate diagnositic tests include a comprehensive exam by an ophthalmologist including a slit lamp exam, determination of the intraocular pressure, and dilated fundus examination if possible. Orbital x-rays may be indicated to rule out other orbital injuries depending on the mechanism of injury. A platelet count and coagulation studies may be indicated, and a sickle prep or hemoglobin electrophoresis should be performed if there is a question of sickle cell anemia.

III. Treatment

A. Outpatient Treatment

If the individual is reliable and the hyphema is not severe and there are no other complicating factors, this condition can be managed as an outpatient. All patients require strict bed rest for five days except for daily examinations. Topical cycloplegics, steroids, and ocular hypotensive agents are indicated at the discretion of the physician. Oral prednisone and/or aminocaproic acid may also be used at the discretion of the physician. A hard shield is typically worn throughout the day and night. After several weeks a gonioscopy is indicated to evaluate the trabecular meshwork.

B. Inpatient Treatment

If there is a significant hyphema, marked elevation of intraocular pressure, other complicating factors (e.g. sickle cell anemia, hyphema in a monocular patient, other ocular injuries) or if the individual does not seem reliable, hospital admission may be indicated to insure strict bed rest and regular follow-up. Oral prednisone and/or aminocaproic acid may also be used at the discretion of the physician. Hospitalization should last five days. Persistent elevated intraocular pressure, corneal blood staining, or persistence of the hyphema in the setting of sickle cell anemia may require surgical evacuation of the clot.

C. Estimated Duration of Care

Return to work anticipated in three weeks for uncomplicated cases. If there is evidence of disruption of intraocular structures, they will require lifetime monitoring for glaucoma and cataracts.

D. Anticipated Outcome

Resolution of the hyphema with return of visual acuity. These individuals should wear polycarbonate safety glasses if involved in an occupation where there is continued risk of ocular injury.

EYELID LACERATION

I. Background

Eyelid lacerations may occur from blunt injuries or from laceration by a sharp object. The lacerations may only involve skin but may involve the eyelid muscles, eyelid margin, the lacrimal drainage system, and may be associated with an orbital foreign body.

II. Diagnostic Criteria

A. Pertinent History and Physical Findings

There is often profuse bleeding. Lacerations through the eyelid margin, in the medial canthus, or resulting in exposure of orbital fat indicate severe injuries and require immediate evaluation. Retained orbital foreign bodies must also be suspected, especially if the injury is caused by an explosion or fragmented object. With severe injuries to the lids, injury to the eye must be ruled out.

B. Appropriate Diagnostic Tests and Examinations

A comprehensive examination by an ophthalmologist including determination of visual acuity, slit lamp and dilated fundus examination is necessary to rule out ocular or orbital injury or foreign body.

III. Treatment

A. Outpatient Treatment

Superficial lacerations or lacerations not involving the lacrimal system or entering the orbit may be repaired in the emergency room or office. Sutures are removed over one to two weeks. Topical and oral antibiotics are usually prescribed. Analgesics may be necessary for pain.

B. Inpatient Treatment

Injuries involving the lacrimal drainage system or penetrating the orbit should be repaired in the operating room. These repairs may require general anesthesia. Intravenous antibiotics are often indicated. Depending on the severity of the injury and overall condition of the patient, these individuals may be discharged from the recovery room or may require a one or two day hospital stay.

C. Estimated Duration of Care

Return to work anticipated within two weeks in uncomplicated cases. Medical follow-up four weeks if uncomplicated. Damage to the eyelid muscles resulting in traumatic ptosis may require six to twelve months to resolve, or may ultimately require surgical repair.

D. Anticipated Outcome

Resumption of normal eyelid function.

CANALICULAR LACERATION

I. Background

Laceration in the medial eyelid may injure the upper or lower canaliculus or lacrimal sac. Disruption of the lacrimal drainage system may result in constant tearing or the development of an abscess within the lacrimal sac (dacryocystitis). Constant tearing may be no more than a nuisance, but it may also obstruct vision and the presence of an infection within the lacrimal system usually requires surgical repair.

II. Diagnostic Criteria

A. Pertinent History and Physical Findings

There is usually a laceration in the medial eyelid. The laceration may at first glance seem trivial, but any laceration medial to the punctum should raise the suspicion of a canalicular laceration. There may be tearing or bloody tears. The punctum may be displaced laterally.

B. Appropriate Diagnostic Tests and Examinations

A comprehensive examination by an ophthalmologist including determination of visual acuity, slit lamp and dilated fundus examination to rule out other orbital or ocular injuries is necessary. Probing of the canaliculus is indicated to determine if the canaliculus is lacerated and the extent of the injuries. Orbital x-rays or CT scan may be indicated if a fracture or foreign body is suspected.

III. Treatment

A. Outpatient Treatment

Repair of canalicular lacerations requires the operating room, frequently using the operating microscope. The lacerated canaliculi are intubated either with a silicone tube or other stent and the cut ends reapproximated. Depending on the severity of the injury, other complicating factors, and general condition of the patient, these individuals can be discharged from the recovery room. Topical drops and oral antibiotics may be indicated.

B. Inpatient Treatment

If the individual has eaten recently, it may be necessary to delay the surgery for twenty-four to forty-eight hours. Hospital admission may be required if the wound is contaminated and intravenous antibiotics are needed. Admission is also indicated in the presence of other complicating injuries. Complex reconstruction requiring prolonged general anesthesia would also require admission.

C. Estimated Duration of Care

Return to work anticipated in two weeks in uncomplicated cases. Medical follow-up three to six months. Occasionally the repair is unsuccessful, and lacrimal bypass surgery is indicated.

D. Anticipated Outcome

Return of normal eyelid function and elimination of tearing.

ORBITAL CONTUSION

I. Background

An orbital contusion is usually a result of blunt trauma causing swelling and ecchymosis of the orbit. A pure orbital contusion is not associated with any fractures or significant lacerations. There may be significant swelling and initial double vision, but visual acuity is not usually affected, and ocular motility and diplopia return towards normal within several days.

II. Diagnostic Criteria

A. Pertinent History and Physical Findings

If there is a history of blunt trauma to the ocular area, there may be progressive swelling of the lids with ptosis, proptosis of the eye, and diplopia. The swelling and diplopia should improve over several days. Visual acuity is usually normal.

B. Appropriate Diagnostic Tests and Examinations

Orbital x-rays are indicated to rule out a fracture. A CT scan is indicated if the diplopia persists or if there is suspicion of an orbital fracture in spite of normal plain films. A comprehensive examination by an ophthalmologist, including assessment of visual acuity, slit lamp examination, and dilated fundus examination are necessary to rule out concomitant intraocular injury.

III. Treatment

A. Outpatient Treatment

If there are no complicating injuries, an orbital contusion is treated as an outpatient. Analgesics, ice packs, and systemic antibiotics may be indicated.

B. Inpatient Treatment

Diminished visual acuity or severe pain may indicate more extensive injury and may warrant hospital admission for further evaluation and treatment.

C. Estimated Duration of Care

Return to work in one to two days in uncomplicated cases. Disability may be longer if diplopia or ptosis persist.

D. Anticipated Outcome

Resolution of the swelling and diplopia with return of normal ocular motility.

ORBITAL FRACTURE

I. Background

Fractures of the orbit may be indirect, resulting in "blowout" of the orbital floor or medial wall, or direct involving fractures of the orbital rims. Fractures of the orbit open communication between the orbit and the sinuses. Significant fractures may cause ocular motility disturbance from entrapment of orbital content, enophthalmos due to prolapse of orbital contents into the sinus, and dystopia of the eye.

II. Diagnostic Criteria

A. Pertinent History and Physical Findings

There is a history of blunt trauma to the eye, usually by an object larger than the bony orbital opening. The eye may appear proptotic or enophthalmic. Ocular motility is usually diminished. The intraocular pressure may elevate when the eye is turned away from an entrapped muscle. There is usually numbness over the cheek due to injury to the infraorbital nerve. There may be a palpable fracture of the orbital rim. There may also be a fracture of the zygomatic arch. This causes flattening of the cheek and may interfere with opening the mouth.

B. Appropriate Diagnostic Tests and Examinations

A comprehensive examination by an ophthalmologist is necessary, including a determination of visual acuity, slit lamp examination, and dilated fundus examination to rule out intraocular injury. X-ray of the orbits may miss up to 20% of orbital fractures. A coronal CT scan is indicated, especially if surgery is contemplated.

III. Treatment

A. Outpatient Treatment

Not all orbital fractures require repair. If there is no enophthalmos or diplopia, repair may not be necessary. It is appropriate to follow the patient on an outpatient basis for the first one to two weeks to determine if the diplopia is resolving. Oral antibiotics are usually given prophylactically. Analgesics may be required.

B. Inpatient Treatment

Severe facial fractures require hospital admission. Other complicating injuries may also make hospital admission necessary. Surgical repair of the

fractures is usually undertaken within the first three weeks. This usually requires a one to three day hospital stay postoperatively.

C. Estimated Duration of Care

Disability from orbital fracture is usually due to diplopia. Double vision while looking straight ahead or down makes driving, operating machinery, reading, typing, and close work difficult. Double vision within the central 20 degrees of the visual field is considered a 100% loss of ocular motility according to the American Medical Association's Guide to Evaluation of Permanent Impairment.

Diplopia may resolve spontaneously within one to two weeks with small fractures not requiring repair. More severe fractures may have more persistent diplopia. Generally, double vision resolves within two to three weeks after surgical repair unless there is intrinsic damage to the extraocular muscles. It is rarely necessary that eye muscle surgery or further orbital surgery is necessary.

Light work may be done when diplopia is resolved. Heavy work can generally be resumed three weeks after injury if surgery is not required, or three weeks after surgical repair.

Individuals with diplopia in primary gaze, down gaze, or within the central 20 degrees should not drive, operate machinery, or work in a dangerous environment where good peripheral vision is necessary.

D. Anticipated Outcome.

Resolution of diplopia and normal functioning of the eye. Numbness over the cheek may persist for one year or longer and is not affected by surgical repair.

CORNEOSCLERAL LACERATIONS

I. Background

Corneoscleral lacerations are potentially severe injuries resulting from sharp objects making forceful contact with the globe. The severity of such injuries is quite variable and is dependent on the sharpness of the object and its velocity at the time of impact.

II. Diagnostic Criteria

A detailed examination by an ophthalmologist, including visual acuity, slit lamp exam, intraocular pressure, and dilated fundus exam is necessary to determine the extent of injury. If retained foreign body is anticipated, localizing radiologic studies (e.g., CAT scan of orbits) may be required.

III. Treatment

Small partial thickness lacerations may require only follow-up and/or patching. More severe ones may respond to bandage contact lens application and follow-up.

Virtually all full-thickness corneal lacerations require very careful follow-up. Very small ones may respond to bandage lens application with or without cyanoacrylate tissue adhesive and protective shield. Larger ones require surgical repair under general anesthesia and hospitalization.

The goal of management is to restore the eye to its normal anatomic configuration and create a water-tight closure. If the lens is involved in the injury, it often must be removed at the time of surgery. Prolapsing uveal tissue must be replaced. Vitreous must be meticulously removed from the anterior chamber if it is present. Involvement of retinal tissue in the injury can make the prognosis much more guarded, and a vetreoretinal surgeon would then be required at the time of initial repair.

Postoperative management usually consists of forms of cycloplegic, steroid, and antibiotic drops.

IV. Estimated Duration of Care and Anticipated Outcome

Partial thickness laceration patients may be managed as outpatients. The patient should wear a protective shield for three to six weeks. Light work may be done after several days. Usually recovery is quite good with normal visual function after six weeks.

Full thickness simple corneal lacerations require two to four months to heal and remove sutures. Protective shield should be worn for six weeks. Light work could be done after two weeks. Return to full work after suture removal in three to four months if vision is adequate for tasks. Sometimes, corneal scar is extensive, and corneal transplant for visual recovery would be necessary at a later date.

Lacerations involving lens, uveal tissue, and retina may require a week's hospitalization and perhaps six months to achieve stability. At that time, contact lens correction of the aphakic condition may allow good visual recovery. Many patients with these severe injuries may never recover full vision, either with later cornea transplant and intraocular lens placement.

CHEMICAL OCULAR INJURIES

I. Background

Chemical injuries may result from an almost infinite variety of agents contacting the ocular surface. The extent of the injury is largely a function of the nature of the substance involved, how much of the ocular surface is involved, and the duration of exposure. In general, alkali injuries (e.g., ammonia, lye, potassium hydroxide, calcium hydroxide [lime] are the most serious because these agents readily penetrate into the ocular tissue. Acid burns (e.g., sulfuric acid, hydrofluoric acid, nitric acid, acetic acid) may be serious but have less penetration than alkalis.

II. Diagnostic Criteria

A detailed examination by an ophthalmologist is performed after copious irrigation (see Treatment). It is vitally important to know the chemical causing the injury, its concentration, and amount of exposure.

In alkali burns, the Hughes classification (grading of corneal haziness and loss of blood vessels at limbus) is helpful in assessing long-term prognosis.

III. Treatment

Acute phase (0 to 7 days). Immediate copious irrigation using any nontoxic irrigating solution is the most important treatment of any chemical injury. It should be continued for at least 30 minutes. Checking the pH until it returns to normal is a good way to determine if enough irrigation is done.

After the irrigation, management by the ophthalmologist may include topical steroids and the use of prophylactic antibiotic drops. Other agents, such as topical ascorbate, cycloplegic agents, etc., may be warranted.

Severe chemical injuries should be hospitalized for treatment for several days. For milder cases, outpatient care with frequent follow-up (every several days for first three weeks) is appropriate.

IV. Estimated Duration of Care and Anticipated Outcome

Quite dependent on extent of initial injury. Milder injuries may return to work after several days. Moderate chemical injuries (if bilateral) may need several weeks to recover. Severe burns (if bilateral) may be blinding. In many cases, corneal transplants, performed months after the initial injury, may be able to restore vision.

PROTOCOL HISTORY:

Passed: 12/15/92
Effective: 1/04/93
Reviewed with no changes: 11/29/2005

PROTOCOL FOR THE EVALUATION AND MANAGEMENT OF ACUTE SHOULDER INJURIES

INTRODUCTION:

This protocol is designed to aid the practitioner in the appropriate evaluation and management of acute shoulder girdle injuries. The goal of early evaluation is to establish a precise diagnosis in order to initiate effective management.

The vast majority of shoulder injuries result from soft tissue rather than bony injury. Injuries can result from direct or indirect trauma, or overuse. The affected soft tissues include muscles, ligaments, and tendons. These problems fall into major categories; instability and dislocations (acromioclavicular and glenohumeral), rotator cuff tendon and subacromial disorders, and periscapular muscle injuries.

Shoulder pain as a result of cervical spine pathology should always be considered and excluded before definitively determining a diagnosis for shoulder pain.

Overuse injuries can present with acute or chronic symptoms and may be the result of acute tendonitis and bursitis or chronic degenerative conditions. Overuse injuries of the shoulder include scapular muscle strain, rotator cuff tendonitis (impingement) and tearing, and arthritic conditions of the glenohumeral joint and acromioclavicular joint.

In general, patients with shoulder injuries should be referred for orthopaedic, physiatric, neurologic, or rheumatologic consultation or treatment under the following circumstances:

1. History of radiographic evidence of joint instability such as acromioclavicular, sternoclavicular, or glenohumeral joint subluxation or dislocation.
2. Significant lack of active motion and/or weakness.
3. Evidence of neurologic injury.
4. Shoulder fracture.

5. Significant obvious soft tissue swelling or echymosis.
6. Failure of shoulder sprain or strain to demonstrate progressive resolution of symptoms and respond to appropriate conservative management within 4 weeks.

EVALUATION:

Evaluation of shoulder injuries includes detailed history, physical examination, and plain radiographs. Details of prior related conditions, co-morbid medical conditions, work history, mechanism of injury, and current symptoms should be obtained. A careful physical examination includes observation, palpation, and assessment of active and passive motion, strength and stability. Significant acute shoulder injuries should be evaluated with x-rays to assess acute injury and signs of chronic pathology. Specific attempts should be made to diagnose injuries such as extensive acute rotator cuff tearing that may be best treated with early surgery.

INITIAL TREATMENT:

Initial management of most shoulder injuries includes a combination of the following:

1. Non-narcotic analgesics and non-steroidal anti-inflammatory drugs, and ice for symptomatic relief.
2. Short-term sling immobilization.
3. Physical therapy for range of motion, progressive resistive exercises, and symptom control. Appropriate modalities include, but are not limited to, ice, ultrasound, phonophoresis, heat.

   Customary and usual therapy documentation requirements prevail. Therapy treatments may be indicated beyond the initial 9 visits, as the expected healing time is 4 to 6 weeks. Reauthorization for continued treatments should follow the normal requested procedures and be based on improvement in objective measures. Prolonged therapy is not indicated if a patient's status is not improving.

4. Corticosteroid injection for overuse injuries.
5. Activity modification.

Initial management should continue for 4 to 6 weeks. Resolution of symptoms and resumption of normal activities is anticipated.

FURTHER EVALUATION:

If symptoms persist despite a trial of initial treatment, further evaluation can be pursued in order to determine a diagnosis. Additional testing includes:

1. CT scan or radionuclide bone scan to evaluate bone and joint pathology.
2. Arthrogram to evaluate for rotator cuff tearing.
3. MRI to evaluate periarticular soft tissues, including the rotator cuff, capsule, and labrum.
4. Electrodiagnostic studies (EMG/NCV) to evaluate for neurologic pathology.

FURTHER TREATMENT:

Further treatment should be based upon the results of additional evaluation. Surgically treatable pathology can be addressed with arthroscopy and/or open surgery. Arthroscopy permits minimally invasive surgery both to confirm a diagnosis and perform debridement, excision, or repair. The outcome of arthroscopic and open surgical treatment of specific diagnostic entities should be the same.

Postoperative rehabilitation duration will vary with arthroscopic and open surgeries. In general, arthroscopic debridement/acromioplasty should resolve within 6 weeks of therapy. Open repairs require more prolonged therapy, but should be completed within 12 weeks of rehabilitation.

Therapy following arthroscopic repairs should focus on regaining full range of motion, with progression to strength and endurance exercises as soon as tolerated. Use of strength and isokinetic equipment is appropriate; use of modalities other than ice is not generally indicated.

Therapy following open repairs requires a number of weeks with passive range of motion only (per individual orthopedist protocol). A slower progression to regain active range of motion and strength is then followed. Use of equipment and job simulated tasks are appropriate in the later phase of treatment. Short-term modalities may be indicated when initially regaining range of motion.

Customary and usual therapy documentation requirements would still prevail.

PROTOCOL HISTORY

Original Passed: 9/1/92
Original Effective 9/22/92

Replacement Protocol Passed: 6/9/98
Replacement Protocol Effective: 6/30/98

Reviewed with no changes: 4/4/2006

PROTOCOL FOR THE MANAGEMENT OF ACUTE INJURIES TO THE KNEE

INTRODUCTION

The vast majority of knee injuries result from direct trauma to the joint or are caused by torsional or angulatory forces. These injuries vary in severity from simple ligamentous strains to complex injuries involving ligamentous disruption with meniscal damage and associated fractures.

The protocol is designed to guide the practitioner in the appropriate management of these injuries and to establish a logical sequence for the diagnostic evaluation and treatment of the more complex injuries.

In general, knee injuries should be referred for orthopedic consultation and/or treatment under the following circumstances:

1. Failure of a presumed knee sprain to show progressive resolution and respond to appropriate conservative treatment in a period of three (3) weeks.

2. Radiographic evidence of an associated fracture.

3. The initial presence of a tense hemarthrosis or the development of a recurrent hemarthrosis.

4. An acutely locked, or an acutely dislocated knee.

5. Clinical evidence of gross ligamentous instability.

6. A presumed diagnosis of a meniscal injury.

ACUTE KNEE SPRAINS

These are common injuries usually resulting from the application of a torsional or angulatory force to the knee and are characterized by pain, swelling, localized tenderness, increased discomfort on weight bearing, negative x-rays, and no clinical evidence of instability.

Appropriate Diagnostic Tests:

- Plain x-rays.
- MRI of Knee by Orthopedic Specialist, Rheumatologist, or Physiatrist

Surgical treatment and inpatient treatment are not indicated for this injury.

Outpatient/Non Operative Treatment:

1. Medications to include analgesics and non-steroidal anti-inflammatory drugs.

2. Application of ice, compression dressings, and temporary partial restriction of weight bearing.

3. Physical modalities and/or rehabilitative procedures.

Duration of Treatment:

Should not exceed three (3) weeks.

Anticipated Results:

Resolution of symptoms and resumption of normal activities.

MENISCAL INJURIES

The mechanism of injury is similar to that for knee sprains but symptoms of pain and swelling fail to resolve in the anticipated period of time and the symptoms frequently include a sensation of “catching or giving away” of the joint and a history of locking of the joint may be elicited.

Clinical findings may include joint space tenderness, a mild effusion, restricted range of motion, or a positive McMurry’s sign.

Diagnostic Studies:

1. Plain x-rays

2. Arthrocentesis

3. MRI

4. Arthrogram, especially when an MRI is contraindicated

5. Bone scan

6. Diagnostic Arthroscopy.

Treatment:

1. Outpatient/Non Operative Treatment

A. Short-term use of non-steroidal anti-inflammatory drugs in conjunction with an Arthrocentesis and short-term immobilizationwith a period of limited weight bearing.

B. Physical modalities and/or rehabilitative procedures.

2. Outpatient/Operative Treatment

A. Options include arthroscopic menisectomy and/or arthroscopic meniscal repair.

B. Physical Therapy/Rehabilitation.

3. Inpatient/Non Operative Treatment

Not indicated.

4. Inpatient Operative Treatment

The reasons for admission for surgical treatment may include the presence and associated medical conditions, a concomitant knee injury such as a fracture of the tibial plateau or a major ligamentous disruption, or the presence of other injuries which require inpatient treatment.

A. Treatment options include:

1. Arthroscopic menisectomy or meniscal repair.

2. Open arthrotomy for menisectomy or meniscal repair.

B. Physical modalities and/or rehabilitative procedures.

C. Duration of treatment generally may vary up to three (3) months or to a point of maximum medical improvement. The patient's age and pre-existence of arthritic changes within the joint influence the duration of treatment.

D. Anticipated Outcomes:

1. Improved knee function with minimal residual symptoms.

2. Possible predisposition to the development of traumatic arthritis of the knee.

PROTOCOL HISTORY:

Passed: 9/01/92
Effective: 9/22/92
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Effective:12/10/02

LOW BACK
MUSCULOLIGAMENTOUS INJURY (SPRAIN/STRAIN)

I. BACKGROUND

Injuries to the muscles (strains) and ligaments (sprains) of the low back are a common cause of acute low back pain encountered in the general population. These injuries often are the result of the mechanical stresses and functional demands placed on the low back area by everyday activities. Symptoms are believed to be related to a partial stretching or tearing of the soft tissues (muscles, fascia, ligaments, facet joint capsule, etc.) The conditions, for the vast majority of patients, is of short duration and complete recovery is the general rule. Most patients with musculoligamentous injury to the low back recover rapidly, WITH 50% to 60% OF PATIENTS RECOVERING WITHIN ONE WEEK.

II. DIAGNOSTIC CRITERIA

A. Pertinent Historical and Physical Findings

Onset of low back pain and paraspinal muscle spasm begins either suddenly after the injury occurs or develops gradually over the next 24 hours. The pain is usually relieved by rest and aggravated by motion of the back. The pain does not radiate below the knee, and the strain is not accompanied by paresthesias or muscle weakness in the legs. Physical findings include low back tenderness to palpation, loss of normal lumbar lordosis, and spasm of the paravertebral muscles. Straight leg raising and other tests that cause spinal motion may increase low back pain. The patient may stand with a list to the side or in a flexed position. Neurologic examination and nerve root stretch test are commonly negative.

B. Appropriate Diagnostic Tests and Examinations.

Although the diagnosis of a musculoligamentous injury is not based on radiographic criteria, x-rays may be indicated in some cases.

C. Inappropriate Diagnostic Tests and Examinations during the acute phase of the first four weeks.

1. CT Scan
2. MRI
3. Bone Scan
4. Myelography in the absence of sciatica
5. EMG in the absence of abnormal neurologic findings
*6. Thermogram
*7. Evoked Potentials
*8. Myeloscopy
*9. Spinoscopy

**D. Indications For Appropriate Specialist Consultations

1. Failure of conservative treatment in four weeks.

III. TREATMENT

A. Outpatient Treatment

1. Nonoperative Treatment

a. Indications: Almost all patients with low back musculoligamentous (sprain/strain) can be treated satisfactorily. No indications exist for the use of surgery in the treatment of low back musculoligamentous injuries.

b. Treatment Options

1. Short-term bed rest for approximately 2-4 days
2. Analgesics
3. Muscle relaxants as needed
4. Anti-inflammatory nonsteroidal medication
5. Physical modalities in conjunction with progressively increasing activity and instruction in proper body mechanics and flexibility, endurance, and strength reactivation exercises.

6. Referral for physiotherapy and/or occupational therapy

a. Therapy may be initiated as early as the day of injury; indications for and focus of (early) intervention include:
* acute management of pain/spasms
* instruction in range of motion and stretching exercises
* limited use of passive modalities, except unlimited ice
* assessment of return to work readiness and identifying necessary work modifications
* patient education in healing process and body mechanics

Time Frame: May range from one visit only to 1 to 2 hours per day.

b. Expansion of therapy programs are indicated when patients do not return to work at their formal level. Exercise programs are progressively increased to include strengthening and conditioning exercises. Work simulation activities (also gradually increased) focus on essential work tasks needed, such as pushing, pulling, lifting, etc.

Time Frame: 1 to 4 hours per day, 3 to 5 days per week.

c. Progress reports to physician and employer should identify continuing deficits, progress made, further rehabilitation needs, and level of return to work readiness. A patient may continue in therapy, if indicated, after return to work at modified level.

d. Therapy evaluations must be provided by licensed physical and occupational therapists; treatments can be provided by licensed or certified PT and OT assistants

supervised by therapists, and by therapy aides as directed by therapists or physiatrists. Exercise physiologists may also be a part of the rehabilitation team.

e. Initiation of therapy intervention may not be indicated when:
* Patient has been out of work greater than 12 weeks.
* Few objectively measured deficits are found on evaluation.
* Subjective c/o pain are only finding.
* Pain behaviors are interfering with return to work process.
** Thorough evaluation and treatment planning by all parties, including a psychologist, is strongly recommended at this stage.

f. Inappropriate treatment is exclusive use of passive modalities; example - ultrasound, moist heat, muscle stimulation and traction. Generally inappropriate modality at any time is traction.

7. Manipulation of spine may provide short-term symptomatic relief
8. Occasional trigger point injections may provide symptomatic relief
9. Lumbosacral corset or brace may be used temporarily

B. Inappropriate Treatment

1. Operative treatment is inappropriate for low back strain
2. Prolonged bed rest beyond five days
3. Narcotic medication for prolonged period
4. Home traction for prolonged period of time in conjunction with bed rest

* Never appropriate
** Neurologist, Orthopedic Surgeon, Physiatrist, or Neurosurgeon

5. Inpatient treatment

C. Estimated Duration of Care: 1 to 4 weeks

D. Anticipated Outcome

1. Resumption of normal activity without residual symptoms in most cases

E. Modifiers (age, sex, and co-morbidity)

Co-morbidity (e.g., degenerative disk disease, spondylolisthesis, segmental instability, osteoporosis, spine deformity) may be associated with a higher incidence of persistent symptoms.

F. Durable Medical Equipment Guidelines for Low Back Pain

Durable Medical Equipment (DME) items may be utilized in the rehabilitation of individuals with low back pain (LBP). Items such as viscoelastic insoles have broad applicability to various LBP conditions, and may be ordered by any licensed physician or therapist. These insoles may be replaced every six months.

DME items such as lumbar orthoses may be contraindicated in certain conditions, or should be used in conjunction with a comprehensive rehabilitation program. These items should be prescribed by a specialist physician, and may include:

1) OTC LSO (abdominal support, with or without polypropylene lumbar pad)
2) Custom LSO or TLSO
3) TENS unit
4) Pelvic traction, home unit
5) Static Magnetic field (300-500 Gauss) belt

Items #1-5 are prescribed as "one-time only" devices, and multiple prescriptions for the same patient injury are not permitted. Equipment such as a hospital bed, scooter or seat-lift chair is rarely, if ever, indicated for the patient with lumbar strain or disc herniation, and is reserved for those individuals with lumbar fracture, paraparesis, or severe cardiopulmonary disease as complications to a diagnosis of LBP.

TENS units are most often prescribed after a trial use period of one (1) to three (3) months. The rental fee is not uniformly applied to the purchase price. Prescription of a TENS unit may be completed with the following requirements:

1) The injured worker has completed a trial utilization period of not less than two months.
2) Physician has documented achieved goals of reduction in medication or procedure-related complications or side effects.
3) Functional status improvements have been documented by the clinical care provider.

NOTE: Low Back Musculoligamentous Injury (Sprain/Strain) will also include BACK SPASM, BACK SPRAIN, SUBLUXATIONS, FACET ARTHROPATHY, SPONDYLOLISTHESIS WITH NO NEUROLOGIC INVOLVEMENT, ANNULAR TEARS, MYOFASCIAL PAIN, SPINAL STENOSIS.

PROTOCOL HISTORY:
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Effective: 12/10/02

HERNIATED LUMBAR DISK

Patients with sciatic nerve pain under treatment by their own physician who fail to improve after four weeks - refer to a Neurologist, Orthopedic Surgeon, Physiatrist, or Neurosurgeon for consultation and/or treatment.

I. BACKGROUND

A herniated lumbar disk is a condition in which there is protrusion of the intervertebral disk. Herniations occur most commonly through a posterolateral defect, but midline herniations may occur. Resulting compression of the spinal nerve root causes inflammation and pain, usually along the anatomic course of the nerve. In the lumbar spine, this most often occurs at the L4 and L5 disk levels, causing pressure on the corresponding L5 and S1 nerve roots. As a result of both mechanical and biochemical changes around the nerve root, the patient will experience pain, paresthesia, and possibly weakness in one or both lower extremities, usually below the knee. The rare herniations at the L1, L2 and L3 levels are usually associated with pain, paresthesia, and weakness above the knee. Back pain may or may not be a presenting complaint with any herniated lumbar disk.

Most acute lumbar disk herniations occur in patients between 35 and 55 years of age, whereas spinal stenosis usually occurs in patients over 50 years of age. Spinal stenosis may mimic a herniated disk. Patients with spinal stenosis in addition to low back pain will give a history suggestive of neurogenic claudication (pain on walking) and will present radicular signs and symptoms caused by degenerative changes involving the intervertebral disks and the facet joints.

II. DIAGNOSTIC CRITERIA

A. Pertinent Historical and Physical Findings

Back pain is usually the first symptom and may or may not abate as the pain and paresthesia begins to radiate down the lower extremity. Motion of the spine is

limited due to pain and muscle spasm. The neurological examination may be normal if the compressed nerve is still functional, or it may yield objective evidence of impaired nerve conduction (e.g. atrophy, weakness, sensory alteration or diminished reflex) depending upon the anatomic nerve root affected. Signs of nerve root tension (e.g. positive straight leg raising, bow-string test, Lasgue's test) may also be present.

When the L4 disk herniates, it usually causes pressure on the L5 nerve root resulting in weakness of the great toe extensor or other dorsiflexor muscles of the foot and sensory loss along the medial aspect of the foot to the great toe, but it may be associated with a knee reflex abnormality. When the L5 disk herniates, it usually causes pressure on the S1 nerve root, resulting in weakness of the plantar flexors of the foot and a sensory deficit in the posterior calf area and lateral aspect of the foot in addition to a diminished Achilles' reflex.

B. Appropriate Diagnostic Tests and Examinations

1. Clinical examination by Neurologist, Neurosurgeon, Physiatrist, Orthopedic Surgeon.
2. Plain radiographs of the lumbosacral spine may be indicated.
3. MRI Imaging is the prime radiologic test in evaluating a herniated disk suspect, which in addition to the disk would evaluate tumor, infection, fracture and congenital abnormalities.
4. CT Scan may be ordered if there is a specific bone problem that may be better delineated by that test.
5. EMG may be done three or four weeks following the onset of symptoms to diagnose and assess the extent of nerve dysfunction and may be necessary to correlate the affected level by the findings on the above testing.
6. Myelography is rarely indicated and is done as an outpatient procedure. It may be performed with a CT Scan in an instance where the above studies leave some question.

C. Inappropriate Diagnostic Tests and Examinations

1. Myeloscopy
2. Thermography
3. Spinoscopy
4. Dermatomal Somatosensory Evoked Potential

III. TREATMENT

A. OUTPATIENT TREATMENT

1. Non-operative Treatment

a. Short period of bed rest, up to 10 days, with analgesics, mild relaxants, and nonsteroidal anti-inflammatory drugs. Complete bed rest for long periods may be deleterious to the body and should be closely monitored.
b. Physical therapy and/or rehabilitation.
c. Injection of trigger points, spinal nerve blocks.
Outpatient Procedure.

d. Epidural steroid injections.
Outpatient Procedure.
e. Pain clinic - chronic phase.
f. Orthodics.

B. INPATIENT TREATMENT

1. Non-operative Treatment

Rarely is their indication for admission but in some cases inability to control pain may require a short period of hospitalization.

2. Operative Treatment

a. Indications.

1. Failure of nonoperative treatment to relieve symptoms.

2. Quality of patient's life significantly impaired.

3. Presence of significant or progressive neurological deficit.

b. Procedure Options

1. Laminectomy with diskectomy.
2. Laminotomy with diskectomy.
3. Microdiskectomy.
4. Percutaneous diskectomy (in developmental phase).
5. Interbody fusion.
6. Posterior or lateral bony fusion.
7. Transpedicular fixation.

c. Indication for Discharge

1. Uncomplicated
   a. One day following microdiskectomy or percutaneous diskectomy.
   b. One to two days after open diskectomy.

2. Complicated - after wound infection, thrombophlebitis, spinal fluid leak, or other significant complications have been controlled.

d. Home health care may be required for a short period.

e. Physical modalities and/or rehabilitative procedures.

1. Some monitoring of the patient's activities may be necessary.
2. Patient should be instructed in walking program with a gradual increase in their physical activities.
3. Strengthening exercises or work simulation activities may be indicated for some patients.

C. ESTIMATED DURATION OF CARE

In both non-operative and operative treatment, it would depend on the degree of improvement and the length of time his physical impairment will enable him to return to his pre-operative occupation or the availability of a transfer to a less demanding physical position.

D. MODIFIERS (age, sex, and co-morbidity)

Patients with symptoms suggestive of cauda equina syndrome will require a different approach to treatment. Cauda equina syndrome is usually caused by a central herniated disk. Symptoms include low back pain, unilateral or bilateral leg pain and weakness, saddle anesthesia, and paralysis with loss of bladder and bowel control. Once this diagnosis is suspected, the patient should undergo prompt neurodiagnostic evaluation. Early surgery is recommended; however, there is no evidence that neurologic recovery will be effected.

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Revised: 11/19/02
Revision Effective:12/10/02

LUMBAR FUSION

A. Indications for Lumbar Fusion

1. Unstable vertebral fracture

2. Fusion may be indicated after second or third surgery with documented MRI, CT Scan or myelogram showing re-extrusion of previously unsuccessfully operated disc at the same level, with or without intractable back pain and clear clinical evidence of new lumbar radiculopathy with EMG evidence, if felt needed.

3. Traumatic (acquired or congenital) spinal deformity, history of compression wedge fractures with demonstrated acquired kyphosis-scoliosis.

4. Intractable low back pain for longer than three months and six week trial with a rigid back brace or body cast producing significant pain relief associated with one of the following conditions involving the lower lumbar segments below L3.

a. For first surgery only, degenerative disk disease with pre-operative documentation of instability
b. Pseudoarthrosis
c. For second or third time disk surgery

B. Contraindications for Lumbar Fusion

1. Primary surgery for a new, acute disk herniation with unilateral radiation leg pain

C. Surgical Procedures

1. Posterior or lateral bony fusion
2. Transpedicular fixation

PROTOCOL HISTORY:
Passed: 9/01/92
Effective: 9/22/92

POST-CONCUSSION SYNDROME

I. BACKGROUND

A clinical syndrome characterized by headache, dizziness, memory dysfunction, depression, etc., that follows head trauma of variable severity. There is little relationship between the serious nature of the trauma and the severity and the time duration of the symptoms.

II. DIAGNOSTIC CRITERIA

Persistent dysfunctional state following head trauma without clinical or laboratory sign of serious intracranial or cervical spine disorder.

A. Appropriate Diagnostic Tests and Evaluations (many of the tests will have been performed during the acute management of the cranial trauma).

1. Neurological or neurosurgical examination
2. MRI Scan, generally non-contrast
3. EEG could be used when determined appropriate by consulting neurologist or neurosurgeon.
4. Cervical spine films (question of associated cervical injury)
5. Neuropsychological testing 4 weeks postconcussion

III. TREATMENT

A. Outpatient (the condition does not warrant inpatient care).

B. Symptomatic Therapy

1. Analgesia
2. Medication for labyrinthine dysfunction
3. Narcotic medication is rarely indicated

IV. ESTIMATED DURATION OF CARE

Variable, but return to work anticipated in four weeks or less. There is rarely an indication for a more protracted period out of work.

V. ANTICIPATED OUTCOME

1. Full recovery
2. There may be some residual symptomatology that will limit the character of work performed. Example: dizziness that might make exposure to heights, moving machinery, etc., impractical.

PROTOCOL HISTORY:
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CHRONIC REGIONAL PAIN SYNDROME (CRPS)
(Also referred to as reflex sympathetic dystrophy or causalgia)

I. Background

Complex regional pain syndrome is a descriptive term encompassing a variety of painful conditions following injury, which appear regionally and have a distal predominance of abnormal physical examination findings. This painful condition typically follows a traumatic injury or noxious event to an extremity, with a disproportionate response respective to the original insult. Medical conditions including stroke and myocardial infarction may also be precipitating factors. The pain pattern is not limited to the distribution of a single peripheral nerve, and physical findings include edema, alterations in skin blood flow, abnormal sudomotor activity in the region of pain, allodynia or hyperalgesia.

CRPS Type I (Reflex Sympathetic Dystrophy)

1. Type 1 CRPS is a syndrome that develops after an initiating noxious event.
2. Spontaneous pain or allodynia/hyperalgesia occurs, is not limited to the territory of a single peripheral nerve and is disproportionate to the inciting event.
3. There is or has been evidence of edema, skin blood flow abnormality, or abnormal sudomotor activity in the region of the pain since the inciting event.
4. The diagnosis is excluded by the existence of conditions that would otherwise account for the degree of pain and dysfunction.

CRPS Type II (Causalgia)

1. Type II CRPS is a syndrome that develops after a nerve injury. Spontaneous pain or allodynia/hyperalgesia occurs and is not necessarily limited to the territory of

the injured nerve.

2. There is or has been evidence of edema, skin blood flow abnormality, or abnormal sudomotor activity in the region of the pain since the inciting event.

3. The diagnosis is excluded by the existence of conditions that would otherwise account for the degree of pain and dysfunction.

II. Diagnostic Criteria

1. History of a noxious event or cause of immobilization.

2. Continued pain, allodynia or hyperalgesia out of proportion to the injury.

3. Physical evidence of edema, trophic skin changes, hair loss, alterations in skin blood flow or abnormal sudomotor activity in the region of pain.

4. The diagnosis is excluded by the existence of conditions that otherwise account for the degree of pain and dysfunction.

III. Diagnostic Studies

1. Surface temperature measurements indicating at least 1 degree Celsius asymmetry between the normal and injured sides. The existence of a skin temperature differential may vary, and repeated measurements are helpful. The injured side may be warmer or cooler.

2. A three-phase radionuclide bone scan may assist in diagnosis. A normal study does not exclude this diagnosis, however.

3. Radiographic studies of the injured extremity may show patchy demineralization in some cases.

IV. Treatment

Treatment for complex regional pain syndrome type 1 (reflex sympathetic dystrophy) should be directed at providing pain control in an effort to promote participation in a directed physical and/or occupational

therapy program to restore use and function of the injured extremity. Treatment options include:

A. Pharmacologic Agents
   - Nonsteroidal anti-inflammatory drugs
   - Tricyclic antidepressants
   - Anticonvulsants
   - Oral opioids
   - Oral steroids

B. Physical Modalities
   - Range of motion exercises (passive, active assisted, active)
   - Weight-bearing exercises
   - Edema-control garments (stocking or glove)

C. Injection Techniques
   - Somatic and sympathetic nerve blocks

D. Surgical Sympathectomy

Surgical sympathectomy is rarely considered effective in resolution of complex regional pain syndromes. These syndromes, including causalgia and reflex sympathetic dystrophy, are related to receptor supersensitivity, and are not caused by over-activity of the sympathetic nervous system. Most patients undergoing a surgical sympathectomy obtain only transient improvement in pain levels, and may suffer serious or disabling complications from the surgery.

The assistance of a pain management psychologist or psychiatrist may be helpful in providing motivational support, assessing and treating co-existing conditions such as depression, and may aid in the establishment of realistic treatment goals and objectives.

This condition may be appropriate for treatment in a multidisciplinary program.

Protocol History:
Passed: 9/1/92
As “Sympathetic Dystrophy”
Effective: 9/22/92
Revised: 11/19/02
Effective: 12/10/02

Thoracic Outlet Syndrome

I. Background

The thoracic outlet syndrome (TOS) is a potential cause of neck, arm, and/or hand pain. TOS is more common among women than men and occurs most frequently in the 2nd through 4th decades. The thoracic outlet is located at the superior aspect of the thorax; neural and/or vascular compression attributed to the thoracic outlet syndrome has been described as occurring up to 9 anatomic locations, with the three most common being (a) the interscalene triangle, (b) between the first rib and the clavicle, and (c) between the pectoralis minor and thoracic cage. Risk factors include anatomic anomalies (cervical rib, long transverse process at the cervical spine, clavicle fracture or anomaly, bifid first rib or fusion of the 1st and 2nd ribs, tumor, subclavian artery aneurysm, etc.), trauma, or occupations requiring prolonged, static shoulder protraction postures and/or frequent shoulder abduction activity such as reaching or lifting over shoulder height.

This diagnosis often requires consultation by a specialist (neurologist, neurosurgeon, orthopedist, physiatrist, or vascular surgeon). Treatment is non-surgical in the majority of cases, but surgical decompression of the brachial plexus and/or vascular structures may be required in some instances.

II. Diagnostic Criteria

A. History and Physical Examination

Patients most commonly complain of supraclavicular shoulder pain with radiation to the medial arm and forearm, often with numbness and/or coolness in the 4th and 5th digits of the hand. Hand weakness or difficulty with fine manipulation may be reported, as well as cold intolerance. Cervical motion may increase symptoms, and headaches may develop. A cool, pale hand or swollen upper extremity may be reported. Symptom duration ranges from weeks to years, with an average of 18 months. Ten percent of patients have bilateral hand symptoms. Differential diagnosis includes carpal tunnel syndrome, ulnar neuropathy, cervical radiculopathy, medical epicondylitis, fibromyalgia, CRPS-1, axillary vein thrombosis, subclavian steal syndrome and/or apical lung tumor.

Physical examination should include a complete orthopedic and neurovascular examination, with attention to: sensation, reflexes, strength, range of motion, muscle atrophy and pulses. Specific diagnostic tests include:

1) Adson's maneuver, in which the shoulder is abducted and externally rotated with the neck extended, and the radial pulse is palpated. A positive test includes a decrease in the radial pulse pressure.

2) Wright's maneuver, in which the shoulders are abducted and externally rotated, as the patient inhales deeply and holds his/her breath. A positive test includes a reproduction of paresthesias in the symptomatic distribution.

3) Roos test, in which the shoulders are fully flexed, and repetitive, rapid finger flexion and extension are performed. A positive test includes a reproduction of paresthesias in the symptomatic distribution.

B. Diagnostic test procedures include:

1) X-rays of the cervical spine, to rule out cervical rib and/or apical tumor.

2) Electrodiagnostic studies including nerve conduction testing and electromyography. A prolongation of the ulnar F wave and/or a decrease in the ulnar sensory nerve action potential (SNAP) may be seen.

3) MRI of the cervical spine and/or brachial plexus may rule out cervical disc herniation or a space-occupying lesion (tumor, cyst, abscess, etc.)

4) MRA or arteriography with the arm in abduction may demonstrate compression of the supraclavicular vasculature.

III. Treatment

A. Non-operative

1) Physical therapy/occupational therapy, with application of a specific exercise protocol. Scapular retraction (passive and active) and cervical active range of motion exercises are generally included.

2) Avoidance of carrying heavy objects; avoidance of persistent and/or repetitive activities with the shoulder flexed and/or abducted.

3) Medication: analgesics, NSAIDs, tricyclics, muscle relaxants and/or anticonvulsants

B. Operative

1) Surgical resection of a segment of the first rib

2) Scalenectomy or removal of cervical rib or rudimentary rib via a supraclavicular approach

IV. Estimated Duration of Care

Non-operative care options are indicated prior to consideration of operative treatment. Non-operative care may be provided for at least 8 weeks prior to considering surgery, and may be continued until the point of maximum medical improvement.

Operative treatment, followed by a post-operative treatment phase of up to six months' duration, should lead to a point of maximum medical improvement in most cases.

Protocol History:

Passed:	9/1/92
Effective:	9/22/92
Revision Passed:	9/16/03
Effective:	10/7/03

PROTOCOLS FOR INJURIES TO THE FOOT

FOOT FRACTURES (DIGITAL)

A. Background

Digital fractures occur frequently in the workplace and in a variety of fashions ranging from the relatively simple non-displaced fracture of the 5th toe to the significantly more damaging intra-articular great toe fracture.

Modes of occurrence usually fall into stubbing or trauma from a falling object. The occurrence of all of these injuries is reduced significantly by wearing of "safety shoes".

B. Diagnostic Criteria

1. Pertinent Historical and Physical Findings:

Typically the patient complains of pain, edema, and erythema as well as difficulty in wearing certain shoe gear and pain on ambulation. Symptoms are easily reproducible by palpation of the affected part.

2. Appropriate Diagnostic Tests and Examinations.
   A. Standard radiographs in A.O., lateral and medial obligue projections.

C. Varieties

1. Fracture Lesser Digit (i.e., 2nd - 5th toes)

A. Non Articular Phalanx Fractures

Treatment

1. Non-displaced (most common)
   a. Buddy splint and fracture shoe for 4 weeks

2. Displaced (less common)
a. Closed reduction (with local anesthetic block if necessary) followed with Buddy splint and fracture shoe for 4 - 6 weeks.
b. Open (rare) with prior authorization
Return to modified work when able.

B. Intra Articular Proximal Phalanx Fractures

Treatment: Displaced or non-displaced

Closed reduction

To restore digital alignment followed by a Buddy splint and fracture shoe for 4 weeks.
Return to modified work when able.

2. Fracture of the Great Toe

A. Varieties

I. Simple Non Communited Fracture Distal Tuft

Treatment

1. Reduce subungual hematoma when present, either by nail puncture or removal.
2. Fracture shoe for 4 weeks.
3. Return to work when able, modified duty, up to 4 weeks.

II. Communited Fracture Distal Tuft

Treatment

Closed - Removal or puncture of nail plate to relieve subungual hematoma. Follow with a fracture shoe for 4 weeks.

Treatment

Open

1. Appropriate tetanus prophylaxis and antibiotics

2. Open reduction in O.R. to debride necrotic tissue, all loose and exposed bone. Followed by fracture shoe for 4 - 6 weeks.

Return to work, modified duty, when able.

III. Intra Articular Dorsal Avulsion Fracture of Distal Phalanx Base (EHL Avulsions)

Treatment

A. Displaced (more common)
Open reduction with necessary internal fixation.
Followed by fracture or short leg cast for 4 - 6 weeks.

B. Non-displaced
Fracture shoe for 4 weeks
Return to work, modified duty, when able.

IV. Great Toe Intra Articular Fractures of the Distal or Proximal Phalanx

Treatment

A. Non-displaced

Buddy splint, fracture shoe for 4 weeks.

B. Displaced

1. Attempt closed reduction first - follow with Buddy splint and fracture shoe for 4 weeks.

2. Open when alignment of articular surfaces fail.

Follow with fracture shoe for 4 - 6 weeks.

Return to work, modified duty, when able.

V. Great Toe Proximal Phalanx Fracture

Treatment

A. Displaced

1. Closed reduction with or without percutaneous pinning followed by Buddy splint and fracture shoe for 4 weeks.

B. Non-displaced

1. Buddy splint and fracture shoe for 4 weeks

Return to work, modified duty, when able.

VI. Great Toe - First MTP Intra Articular Condylar Fractures of the Proximal Phalanx

A. Displaced

Treatment

Open reduction with appropriate internal fixation. Smaller bone fragments excised and intrinsic musculature reattached as necessary followed by fracture shoe for 4 - 6 weeks.

B. Non-displaced

Treatment

Buddy splint and fracture shoe for 4 weeks.

Return to work, modified duty, when able.

SUMMARY

Most digital fractures occur from blunt trauma or stubbing. Extent of injury and disability established by force created by stubbing. Duration of treatment has been established for most common forms of digital fractures; however, the nature of patient's occupation will sometimes allow for return to work before the fracture treatment is completed. It must be established by the treating physician whether or not a return to work will delay healing or put the worker at risk for further injury. Often times a change to a temporary seated job will allow for more rapid return to the workplace.

Estimated Duration of Care

1. Non-displaced digital fracture - 4 weeks

2. Displaced digital fracture treated by open reduction internal fixation - 4 - 6 weeks

Return to work, modified duty, when able.

METATARSAL FRACTURES

Background

Metatarsal fracture can be defined as a break in the structural continuity of one or more of the five metatarsals of either foot. These are long bones, and fracture may occur at the head, neck, shaft, or base. Fracture at a joint surface (intra-articular or osteochondral) may occur as well. They may be classified as open or closed, displaced or non-displaced, simple or communited. A stress or fatigue fracture may occur as well. It is common for metatarsal fractures to be evaluated and treated by category as follows: First Metatarsal, Central (2-3-4) Metatarsal, Fifth Metatarsal, Fifth Metatarsal Jones Fracture, Fifth Metatarsal Proximal Avulsion Fracture, and Osteochondral Fracture.

Typically, metatarsal fractures occur secondary to direct injury or blunt trauma. Examples include dropping a heavy object, kicking a hard surface, or crush injury. However, these fractures may result from indirect trauma, i.e., fall or misstep. Additionally, a stress or fatigue fracture can occur usually of insidious onset from repetitive microtrauma, i.e., overuse of a foot pedal.

Occurrence is variable and not particular to gender or age group. Open fractures and those involving multiple sites are rare. The use of industrial footwear and varied terrain floor surfaces offer protection.

Diagnostic Criteria

A. Pertinent History and Physical Findings

Metatarsal fracture is typically episodic and has an acute onset. It is recognized as a traumatic occurrence and presents with immediate signs and symptoms. An exception would be the stress or fatigue fracture. An accurate history including mechanism of injury, work activity and footwear is vital.

Typically, pain is instantaneous. Localized swelling begins immediately and gradually progresses in a generalized fashion. Patients demonstrate altered weight bearing accompanied by an antalgic gait. A limp often marked by an abducted foot position is marked by a loss in propulsive ability.

Examination reveals maximum tenderness directly over the fracture site with associated swelling. Generalized pain and edema are noted in radial fashion. A hematoma is observed at times. Patients often manifest muscular splinting or guarding. Neurovascular compromise is more common with crush injuries, open fractures, or severely displaced bone fragments. Neurovascular assessment should be made periodically. Crepitus may be palpable at the fracture site as well as an appreciation of fragment displacement. Digital displacement can be noted; and joint pain and/or limited range of motion is common with intra-articular involvement.

B. Appropriate Diagnostic Tests

1. Radiographs of Foot: Routine, minimum of two views. Comparison films of contralateral foot not routinely needed. May repeat ten to twenty-one days later in case of stress fracture.

2. Bone Scan: Not routine. Appropriate when pertinent historical and physical findings yield high index of suspicion with questionable or negative radiograph findings, i.e., stress fracture.

3. CT Scan: Not routine. Appropriate to confirm intra-articular involvement and extent with positive radiographic or bone scan findings. May be appropriate when negative bone scan findings contradict overwhelming pertinent historical and physical findings.

4. M.R.I.: Not routine. May be appropriate when above-mentioned tests fail to confirm fracture presentation despite overwhelming pertinent historical and physical findings along with recalcitrance of injury to four to six weeks of conservative treatment, including immobilization.

TREATMENT

A. Outpatient

1. Non-Operative

a. Indications: Mild-moderate symptoms. Pregnancy. Closed, stable fracture without significant risk of fragment displacement.

b. Supportive Care (may include): Initial use of splint (posterior) with Jones type compressive dressing until edema resolves. NSAID Rx. Narcotic analgesic (oral) Rx for five to seven days.

1. Non-displaced - Appropriate immobilization.

2. Displaced - Closed reduction with immobilization.

c. Treatment Options: Closed reduction manipulation (with or without regional anesthesia and/or sedation) and immobilization.

d. Immobilization Options:

1. Stiff soled medical/surgical shoe (given postoperative):

Commonly utilized with stable isolated fractures of central or fifth metatarsals as well as in later stages of fracture repair following an earlier period of cast immobilization. May be combined with a slipper type cast or compressive type dressing (Unna boot, Gelcast). Frequently used for stress fractures.

2. Cast immobilization (short leg): Considered a universal modality in fracture immobilization. May be represented as removable cast like synthetic walker. Nonweightbearing (NWB) cast typically recommended for fractures of the first metatarsal, multiple, following open reduction and internal fixation (O.R.I.F.), following percutaneous pinning, unstable fractures, osteochondral fractures, and Jones fractures.

e. Fracture Locations

1. First metatarsal (neck, shaft, base): Closed reduction followed by immobilization of six weeks.

2. Central metatarsal (neck, shaft, base): Closed reduction followed by immobilization of six weeks.

3. Fifth metatarsal (neck, shaft): Closed reduction followed by immobilization of six weeks.

4. Fifth metatarsal - Jones Type: Closed reduction followed by immobilization of eight weeks.

5. Fifth metatarsal - Proximal Avulsion: Closed reduction followed by immobilization of six weeks.

6. Osteochondral/Intra-articular: Closed reduction followed by immobilization of six weeks.

7. Stress/Fatigue: Closed reduction followed by immobilization of four weeks.

f. Rehabilitation

1. Appropriate physical therapy modalities.

2. Operative

a. Indications: Displaced fracture fragments nonreducible despite closed reduction attempts. Major avulsion of bone. Multiple fragments. Significant instability of fragments. Intra-articular displacement.

b. Supportive Care: (May include, in addition to above-mentioned item): Antibiotic Prophylaxis

c. Treatment Options: Percutaneous pinning or open reduction internal fixation (O.R.I.F.) and immobilization.

d. Immobilization Options: As noted above.

e. Rehabilitation: As noted above.

B. Inpatient Treatment (Not common)

a. Indications: Crush injury with moderate-severe soft tissue damage. Open fracture. Multiple fractures. Demonstrated need for neurovascular monitor, i.e., questionable distal tissue viability, impending compartment syndrome. Post-operative admission is appropriate to monitor edema, neurovascular status; or to deliver parenteral analgesia.

b. Supportive Care: (May include, in addition to above-mentioned items): Parenteral antibiotics, neurovascular monitor, parenteral analgesics, infectious disease consult, vascular consult, wound packing/ debridement.

c. Treatment Options: Splintage, wound irrigation and debridement. O.R.I.F. (with alternative use of external fixator). NWB cast immobilization/NWB splint with wound access for inspection. Dressing application and wound packing. Delayed primary closure.

d. Rehabilitation: As noted above after eradication of infection if present and wound stabilization/closure.

ACUTE SOFT TISSUE INJURIES

I. Background

Ankle injuries can occur due to an irregular surface, poor shoe gear, or misstep. Injuries to the lateral (outside) ligaments are the most common and can present with very little evidence of injury other than acute swelling and pain and difficulty walking. Injuries to medial (inside) ligaments are less common. Radiographs may be negative and the extent of soft tissue injury to either side is very difficult to define. Chronic instability can be very common if ankle injuries are not treated appropriately initially.

II. Diagnostic Criteria

A. Medial Collateral Ligament Sprain/Rupture

1. Mechanism of Injury: Signs and Symptoms

Medial injuries; solitary injury to the medial ligaments, (deltoid ligament) is uncommon or rare. Usually associated with other injuries to other ligaments and/or fracture. Most common associated injuries are fractures of the fibular and ruptures of the tibial fibular syndesmosis. The force applied to the foot to cause this injury is an external rotation abductory force. Rupture of the deltoid ligament will cause pain and swelling on the medial and anterior aspects of the ankle. There will be tenderness on palpation of the ligament and a palpable defect may pinpoint which ligaments are involved. The fact that a rupture of the deltoid ligament is usually associated with

other injuries, the usual presentation is that of a completely edematous and ecchymotic ankle that is being held in a splinted position.

2. Diagnostic Evaluation

Radiographs AP, lateral, mortise, and a high fibular view. Clinical exam should include range of motion, lateral and rotatory movement of the talus in relation to the tibia and anterior/posterior displacement of the ankle. A frankly unstable ankle is easily recognized, but there is not a reliable clinical means of assessing ankles with intermediate degrees of instability. These injuries can be evaluated with a stress x-ray which may be done by hand or with a Telos apparatus. This is done with a mortise view of the ankle where the foot is abducted and everted in relation to the leg, and a lateral view where the foot is anteriorly displaced in relation to the leg. Stress views are done bilaterally and compared to the injured site. In the mortise view the amount of clear space between the talus and medial malleolus is what is evaluated. A clear space of 1cm or greater is diagnostic for rupture of the deltoid ligament. Further diagnostic studies could include arthrography. MRI is the most specific for ligament rupture and partial rupture.

B. Lateral Collateral Ligament Sprain or Rupture

1. Anatomy

The lateral collateral ligaments are comprised of three distinct ligaments which do not reinforce each other as do the deltoid ligaments. The anterior talo fibular ligament is triangular or fan shaped intracapsular, considered the primary stabilizer of the ankle. Calcaneal fibular ligament is rather narrow and cord-like lying extracapsular just beneath the peroneal tendon sheath. The posterior talo fibular ligament is thicker and stronger than the other two and intracapsular. It is the least injured.

2. Mechanism of Injury Signs and Symptoms

The most common mechanism injury is inversion and plantar flexion of the foot relative to the ankle which

will distort or rupture the anterior talo fibular ligament. If the inversion portion is severe enough, then the calcaneal fibular ligament will be also damaged. In some rare instances, only a true inversion maneuver of the calcaneal fibular ligament may be singularly distorted or ruptured. Depending upon the severity of forces producing the injury, the time span since the injury and initial self-treatment, one may encounter a variety of signs and symptoms. Usually the pain and inability to place weight on the injured ankle will cause the patient to seek medical care. The amount of edema or ecchymosis is <u>not</u> a good indicator as to the extent of ligamentous rupture.

3. Diagnostic Evaluation

After careful history of the injury and performing clinical examination of the foot and lower leg with palpation along the course of each of the tendonous structures and bony structures around the ankle. Anterior lateral along the course of the anterior talo fibular ligament, calcaneal fibular and posterior fibular. Also, palpation of the posterior ankle should be carried out and evaluation of the Achilles tendon and the integrity of the fibular. The ankle also needs to be evaluated for rupture of the tibial fibular ligament and must be checked for possible diastasis. Other injuries associated with ankle is fracture of the 5th metatarsal, anterior superior process of the calcaneus and the posterior lateral tubercle of the talus.

Further studies for chronically unstable ankles or the recurrent ankle sprain would be stress views, inversion stress and push/pull which must be performed bilaterally. The injured ankle must be adequately anesthetized prior to performing these maneuvers in order to prevent peroneal tendons from going into spasm. Common peroneal nerve block or local ankle infiltration seems to work the best. Using Telos equipment for the stress views allows more reproducible date and reduced radiation exposure to the examiner. A 5-6 degree angular difference between the injured and uninjured ankle signifies the ligamentous rupture. Push/pull stress test or the anterior draw signs specifically evaluates the integrity of the anterior talo

fibular ligament. MRI would be the diagnostic procedure of choice or ankle joint arthrography if MRI is not available.

III. Treatment for Ankle Instability and Injury

A. Meticulous replacement or repair of the deltoid ligament does not appear to be essential, and in most instances involving fibular fracture the ruptured deltoid does not need to be repaired if the lateral side was anatomically and rigidly fixed. Surgical repair of the deltoid ligament is clearly indicated if closed reduction does not replace the talus into its proper position. This could occur if the deltoid ligament rolled up or inverted, or if the posterior tibial tendon was trapped. If closed reduction or operative repair of the deltoid ligament is required, the patient is placed in a non-weight-bearing below-the-knee cast for 3-6 weeks. This is followed by a weight-bearing cast below the knee for another 3-6 weeks. Total casting regime could range from 6-12 weeks depending on the individual. In the case of non-operative repair, usual casting would be for approximately three weeks with splinting for another 3-6 weeks with vigorous physical therapy at that point for 3-4 weeks to build up strength in the affected extremity.

B. Treatment for acute lateral collateral ligament distortion, sprain, or true ruptures, are dependent on several factors;

1. How acute, painful, or symptomatic;
2. Negative stress x-rays, ankle MRI, or arthrogram;
3. History of chronic instability;
4. Patients with significant medical history which would contraindicate any more definitive therapy;
5. Patients who lead a sedentary lifestyle;
6. Patients who present for treatment 3-4 weeks following the traumatic episode.

The literature is significantly divided as to the success of surgical intervention vs. conservative treatment with immobilization for ligament rupture. Patients treated conservatively must be forewarned that treatment is aimed only at relieving the signs and symptoms and that the ankle may still be prone to some instability and especially if the ligament is ruptured. For younger, very active patients, more aggressive therapy would be more appropriate.

Initial therapy should consist of:

Compression cast,
Non-weight bearing,
Elevation,
Ice therapy,
Non-steroidal medications.

Patients should be reevaluated approximately 3-4 days following the injury, if there is a marked decrease in symptoms, discomfort, this is a first time injury and upon exam the ankle appears stable, then follow up should consist of splinting or bracing and exercise program for 4 weeks.

If there is no significant improvement, further evaluation and treatment is necessary.

1. Short leg weight bearing cast is applied. Length of casting will vary from 2 - 4 weeks. If testing reveals the osseous and soft tissue structures are intact, then treatment should be centered around combination of stabilizing ankle and aggressive exercise program.

If testing reveals ligamentous rupture, then one must weigh pros and cons of surgical intervention versus conservative immobilization therapy.

For the compliant sedentary patient, one would suggest casting for 3 weeks, then follow up with air cast type splint for approximately 6 weeks.

For the active patient, primary surgical repair should be recommended. This type surgery should be performed after the edema and ecchymosis are under control, if possible a primary repair should be performed within the first 2-3 days following traumatic episode. However, the

literature has shown that the primary repair can be effective as much as 6-12 months after trauma. Follow up includes approximately 3 weeks non-weight bearing immobilization, then 3 weeks weight bearing, then 4 weeks of air cast type splinting. Long-term control and stability of the ankle can be achieved with functional orthomechanical braces in the shoes.

Physical therapy modalities are also utilized to regain full use and strength and improve the proprioceptive activity of the muscle and function of the ankle, for both classes of patients.

For the patient with chronic ankle pain due to multiple ankle injuries or poorly treated ankle injury, proper diagnosis and treatment are necessary to return the patient to normal pain-free activity. Proper identification and diagnosis etiology of pain is imperative to identify which ligaments structures joints are involved so that proper therapeutic modalities can be instituted.

Evaluation is similar to acute injuries consisting of;

1. radiographs,
2. clinical exam,
3. MRI,
4. diagnostic arthroscopy (rare, prior authorization required),
5. injection therapy,
6. physical rehabilitation,
7. surgical intervention with ligamentous reconstruction.

PROTOCOL HISTORY:
Passed: 12/15/92
Effective: 1/04/93

WORKERS COMPENSATION PROTOCOLS
WHEN PRIMARY INJURY IS PSYCHIATRIC/PSYCHOLOGICAL

General Guidelines

Patient must have a diagnosed mental illness on Axis I as defined by DSM-IV that, by accepted medical standards, can be expected to improve significantly through medically necessary and appropriate therapy. The emotional impairment must be of such a degree to severely interfere with social, familial, or occupational functioning.

For the purpose of determining medical necessity of care, medical necessity is defined as "Services and supplies by a provider to identify or treat an illness that has been diagnosed." They are:

A. Consistent with the efficient diagnosis and treatment of a condition, and standards of good medical practice.
B. Required for other than convenience.
C. The most appropriate supply or level of service.
D. Unable to be provided in a more cost effective and efficient manner; and
E. Unable to be provided elsewhere by a less intensive level of care.

The evaluation and assignment of mental illness diagnosis must take place in a face-to-face evaluation of the patient performed by a psychiatrist or doctoral level clinical psychologist.

Presence of the illness(es) must be documented through the assignment of appropriate DSM-IV codes on all axes (I-V), using published criteria.

Whenever feasible and appropriate, psychiatric care and treatment should take place in an outpatient setting or the less intensive treatment setting able to meet the patient's needs. Structured outpatient programs are considered the treatment of first choice. Inpatient treatment is considered medically necessary when all less intensive levels of treatment have been determined to be unsafe or have been unsuccessful.

The initial evaluation should include not only documentation of the diagnosis (DSM-IV, axes I-V) but also an initial treatment plan, individualized goals for treatment, treatment modalities to be used, and discharge planning.

A progress note documenting the provider's treatment, the patient's response to treatment, and the persistence of the problems that necessitate continued care despite treatment efforts, with the emergence of additional problems consistent with the initial diagnosis, must be written for each session of treatment. Documentation of disposition planning should be an integral part of each session note. Response, non-response or severe reactions to medications given must be recorded.

ADULT PSYCHIATRIC HOSPITALIZATION CRITERIA

Medical necessity of psychiatric inpatient admission must be documented based on conditions defined under either Section I or Section II.

I. Criteria for Admission Based on Severity of Illness.

A. Patient makes direct threats or a reasonable inference of serious harm to self or to the body or property of others.

B. Violent, unpredictable or uncontrolled behavior, including patients with organic brain impairment and/or functional illness.

C. Lack of insight, unwillingness or inability to adequately care for one's physical needs. Acute cases may include starvation or failure to take essential medications accurately and safely.

D. Lack of response to previously attempted partial hospitalization management of medication and/or psychotherapy.

II. Criteria for Admission Based on Intensity of Service.

A. Need for daily skilled observation by both MD and RN staff(such as, but not limited to):

(1) To confirm diagnosis;
(2) To initiate medication regime;
(3) To regulate dosage of potent medication; or
(4) To withdraw potent medication.

B. Need for electroconvulsive shock therapy.

III. Criteria for Continued Stay.

The treatment plan should include documentation of diagnosis, individualized goals of treatment and therapeutic modalities. The medical record must include daily progress notes by the psychiatrist or psychologist.

While documentation may justify the need for continued hospitalization, the Medical Advisory Board expects that each service rendered by a physician or other provider of care and reported for payment be documented in the medical record. Documentation should include:

A. The persistence of the problems that necessitated the admission, despite therapeutic efforts, or the emergence of additional problems consistent with the admission criteria.

B. Severe reaction to the medication or need for further monitoring and adjustment of dosage.

C. Attempts at therapeutic re-entry into the community have resulted in exacerbation of the psychiatric illness.

D. Psychiatric evidence or rationale indicating the need for stabilization of patient's condition to a point where stress of community re-entry does not substantially risk an exacerbation of the psychiatric illness.

HOSPITALIZATION CRITERIA FOR SUBSTANCE DEPENDENCY

(Applies to Psychiatric Hospitals and General Hospital Psychiatric Units)

Admission to a psychiatric hospital is appropriate for alcohol and/or drug dependency of a severity which requires intensive intervention by a multi-disciplinary health care team including physicians, nurses, counselors, social workers, and other therapists. Evidence should be present that outpatient care or treatment in an intermediate care facility has been attempted recently, but has been unsuccessful.

The patient also must have, in addition to substance dependency of a severity described above, a psychiatric disorder which inhibits his/her ability to be treated in a less intensive setting. There must be documented evidence of a present and acute psychiatric disorder of a severity which would require hospitalization in and of itself in accordance with the Adult Psychiatric criteria.

I. SUBSTANCE DEPENDENCY CRITERIA FOR REHABILITATION SERVICES FOR ADMISSION.

Patient needs to meet the Adult Psychiatric Admission Criteria and both of the admission criteria given below.

A. Patient has alcohol and/or drug dependency of a severity which requires intensive intervention, at a hospital level of care, by a multi-disciplinary health care team including physicians, nurses, counselors, social workers, and other therapists. Evidence that the patient cannot be treated in a residential center for substance abuse must be documented.

B. Patient has, in addition to substance dependency of a severity described above, a psychiatric disorder which inhibits his/her ability to be treated in a less intensive setting. Evidence of a present and acute psychiatric disorder of a severity which would require hospitalization in accordance with the adult psychiatric criteria must be documented.

II. CRITERIA FOR CONTINUED STAY

The patient needs to meet the Adult Psychiatric Continued Stay Criteria, as well as (all of) A through D below.

A. The treatment plan should include documentation for both the substance dependency and psychiatric disorders of individualized goals of treatment and therapeutic modalities.

B. The medical record should include daily patient's progress notes by the psychiatrist, psychologist, or primary therapist. Evidence should be presented as to whether or not the problems necessitating admission have changed in response to specific treatment modalities being utilized.

C. Documentation of all therapeutic modalities being provided to the patient on a daily basis should be present and should specify the plan of treatment and patient's progress.

D. Post-hospital treatment planning and referral efforts that have been conducted as soon as the initial evaluation is complete must be documented in the treatment plan and progress notes.

RESIDENTIAL TREATMENT CRITERIA FOR SUBSTANCE ABUSE

I. CRITERIA FOR ADMISSION.

Medical necessity for admission to a residential substance abuse treatment facility must be documented by the presence of all of the criteria below in Section A and Section B.

In addition, it is noted that structured professional outpatient treatment is the treatment of first choice. Residential treatment, when indicated, should (a) be individualized and not consist of a standard, pre-established number of days, and (b) should follow recent outpatient treatment in a structured professional program of significant duration and intensity during the course of which the patient has not been able to maintain abstinence for a significant period of time.

A. Severity of Need.

1. The provider must be able to document that the individual has a history of alcohol/substance dependence but is mentally competent and cognitively stable enough to benefit from admission to the inpatient program at this point in time. Individual days during any part of the stay where the patient does not meet this criterion cannot be certified as medically necessary.

2. Individual exhibits a pattern of severe alcohol and/or drug abuse as evidenced by continued inability to maintain abstinence despite recent professional outpatient intervention.

If the patient has not been in a recent outpatient program (i.e., the past 3 months), then the following conditions must be met: 1) patient must be residing in a severely dysfunctional living environment; or 2) there must be actual evidence for, or clear and reasonable inference of serious imminent physical harm to self or others directly attributable to the continued abuse of substances which would prohibit treatment in an outpatient setting.

3. For individuals with a history of repeated relapses and a treatment history involving multiple

treatment attempts, there must be documentation of the restorative potential for the proposed admission.

B. Intensity of Service.

Due to significant impairment in social, familial, scholastic or occupational functioning, the individual requires intensive individual, group, and family education and therapy in an inpatient rehabilitative setting.

II. CRITERIA FOR CONTINUED STAY

In addition to meeting all of the admission criteria on a daily, continued basis, there must be daily documentation supporting the need for continued inpatient treatment. All of A through C below need to be met.

A. Progress Notes - Daily documenting of the providers' treatment, the patient's response to treatment, and the persistence of the problems that necessitated the admission, despite treatment efforts, or the emergence of additional problems consistent with the admission criteria.

B. The persistence of the problems that caused the admission to the degree that would necessitate continued inpatient care, despite therapeutic efforts, or the emergence of additional problems consistent with the admission criteria and to the degree that would necessitate continued inpatient care.

C. Clear and reasonable evidence that re-entry into the community would result in exacerbation of the illness to the degree that would require an inpatient level of care.

CRITERIA FOR ADMISSION AND LENGTH OF STAY FOR ALCOHOL/DRUG DETOXIFICATION AND AN INPATIENT SETTING

Patient must meet both of the criteria under the appropriate section.

I. CRITERIA FOR ADMISSION

A. Patient has a history of heavy and continuous alcohol/drug use requiring detoxification services where (a) there is the potential for serious physical harm from the side effects of withdrawal and (b) these services cannot be provided on an outpatient basis. Services that cannot be provided on an outpatient basis must require intensive nursing and medical treatment intervention on a 24-hour basis in order to be medically necessary on an inpatient basis.

B. Patient presents signs and symptoms of impending withdrawal and/or history of seizures of delirium tremens and requires intensive nursing and medical treatment intervention on a 24-hour basis.

II. CRITERIA FOR CONTINUED STAY

A. Documentation of the need for skilled observation and medical treatment consistent with AEP criteria.

B. Documentation of physical signs and symptoms of acute withdrawal which require intensive nursing and medical treatment intervention on a 24-hour basis. This documentation must be noted three times daily, of which one such notation must be made by a physician.

III. CONDITIONS LIKELY AND UNLIKELY TO BE RELATED TO TRAUMA OR WORK

The following classes of disorders are frequently diagnosed post-trauma:

A. Cognitive Mental Disorders.

Cognitive mental disorders associated with Axis III physical disorders - (mainly deliriums, but occasional dementias).

B. Mood Disorders.

Depressive Disorders NOS
Major Depression (all types)

C. Anxiety Disorders.

Panic Disorder (with or without Agoraphobia)
Agoraphobia without Panic
Specific Phobia
Post-Traumatic Stress Disorder
Generalized Anxiety Disorder
Anxiety Disorder NOS
Acute Stress disorder
Anxiety due to a (compensable) general medical condition

D. Somatoform Disorders

Conversion Disorders
Pain Disorders (all types, if pain secondary to a compensable injury)

E. Adjustment Disorders (all types) (note: reaction lasts no more than six (6) months)

F. Psychotic Disorders NOS
Brief Psychotic Disorder
Psychotic disorder due to a compensable general medical condition

The following classes of disorders are rarely post-trauma and in the committee's opinion are not caused or worsened by industrial injuries, diseases, or stresses.

A. Organic Mental Disorders.

Dementias arising in the senium and presenium, like Alzheimer's.
Multi-infarct dementia.
Psychoactive substance-induced organic mental disorders.
Alcohol (intoxication, idiosyncratic intoxication, uncomplicated alcohol withdrawal, withdrawal delirium, hallucinosis, amnestic disorder, dementia associated with alcoholism)
Amphetamine (intoxication, withdrawal, delirium, delusional disorder)

Caffeine (intoxication)
Cannabis (intoxication, delusional disorder)
Cocaine (intoxication, withdrawal, delirium, delusional disorder)

+ Hallucinogen (hallucinosis; delusional, mood, or post hallucinogen perception disorders)
+ Inhalant (intoxication)
Nicotine (withdrawal)
* Opioid (intoxication, withdrawal)
Phencyclidine (PCP) (intoxication, delirium; delusional mood or organic mental disorders)
* Sedative, hypnotic or anxiolytic (intoxication, withdrawal, withdrawal delirium, amnestic disorder)
* Other or unspecified psychoactive substance (intoxication, withdrawal, delirium, dementia, hallucinosis; delusional, mood, anxiety, personality, or organic mental disorders)

B. Psychoactive Substance Use Disorders.
Alcohol (dependence, abuse)
Amphetamine (dependence, abuse)
Cannabis (dependence, abuse)
Cocaine (dependence, abuse)
Hallucinogen (dependence, abuse)
Inhalant (dependence, abuse)
Nicotine (dependence)
* Opioid (dependence, abuse)
Phencyclidine (PCP) (dependence, abuse)
* Sedative, Hypnotic or Anxiolytic (dependence, abuse)
Polysubstance dependence
Psychoactive substance dependence or abuse NOS

+ = compensable if an industrial agent exposure occurs at worksite.
* = compensable if iatrogenic via treatment for compensable injury.

C. Schizophrenia (catatonic, disorganized, paranoid, undifferentiated, residual).

D. Delusional (Paranoid) Disorder (erotomanic, grandiose, jealous, persecutory, somatic, unspecified)

E. Psychotic Disorders Not Elsewhere Classified
Schizophreniform disorders
Schizoaffective disorders
Induced (shared) psychotic disorder

F. Mood Disorders
Bipolar disorders (Mixed, Manic, Depressed)
Dysthymic Disorder (all types)

G. Anxiety Disorders
Social Phobia
Obsessive Compulsive Disorder

H. Somatoform Disorders
Body Dysmorphic Disorder
Somatization Disorder
Hypochondriasis

I. All Dissociative Disorders

J. Sexual Disorders

All sexual dysfunctions (unless caused by a physical disorder caused by a work injury, or psychogenic only secondary to work stress, disease or injury). Not compensable if lifelong or acquired through other than compensable means.

Sexual disorder NOS

K. Sleep Disorders, all types, - unless there is an organic factor related to the compensable injury.

L. Factitious Disorders, (all types)

M. Impulse Control Disorders Not Elsewhere Classified

Intermittent Explosive Disorder
Kleptomania
Pathological Gambling
Pyromania
Trichotillomania
Impulse Control Disorder NOS

N. V Codes for Conditions Not Attributable to a Mental Disorder that are a Focus of Attention or Treatment.

Academic Problem
Adult Antisocial Behavior
Borderline Intellectual Functioning
Childhood or Adolescent Antisocial Behavior
Malingering
Marital Problem
Parent-Child Problem
Other Interpersonal Problem
Other Specified Family Circumstances
Phase of Life or Other Life Circumstances Problem
Uncomplicated Bereavement

O. Disorders Usually First Evidence in Infancy, Childhood, or Adolescence as defined in DSM-IV Classification

P. All Personality Disorders

UTILIZATION REVIEW CRITERIA

OUTPATIENT MENTAL HEALTH AND SUBSTANCE ABUSE TREATMENT PROTOCOL

Mental health and substance abuse outpatient services are defined as partial hospital, intensive outpatient programs, outpatient therapy, and all other noninpatient treatment. The criteria contained in this protocol have been developed for outpatient mental health and substance abuse services that are less intensive than partial hospitalization or intensive specialty outpatient treatment programs.

Outpatient treatment protocols are based on both necessity of care and treatment approach. Outpatient treatment is based on Severity of Illness (SI) and Intensity of Service (IS) indicators. Patients must have psychiatric and/or substance abuse disorders with appropriate Severity of Illness and Intensity of Service indicators for outpatient treatment to be determined to be medically necessary.

Medical necessity is defined as follows:

"Services and supplies by a provider to identify or treat an illness that has been diagnosed. They are:

a. consistent with:
(1) the diagnosis and treatment of a condition; and
(2) standards of good medical practice;
b. required for other than convenience; and
c. the most appropriate supply or level of service."

The following criteria are a more detailed elaboration of the above definition for the purpose of establishing the medical necessity of outpatient mental health services.

1. The method of treatment specified in terms of treatment framework or orientation, treatment modality, treatment frequency, and estimate of treatment duration;

2. provision of measurable, target criteria for interim goals and end of treatment goals to be used to determine both that 1) treatment is progressing and 2) when treatment is no longer indicated; and

3. an alternative plan to be implemented if patient does not make substantial progress toward the given goals in a specified period of time. Examples of an alternative plan are a second opinion or introduction or adjunctive or alternative therapies.

CONTINUED OUTPATIENT TREATMENT CRITERIA

After initial treatment has been completed (GAF=70), continued psychotherapy treatment is indicated only if criteria below are met.

I. Severity of Illness Indicators

Continued outpatient psychotherapy treatment requires the presence of each of the following Severity of Illness Indicators:

A. A DSM IV diagnosis on Axis I.

B. A description of DSM-IV psychiatric symptoms, behavioral (occupational) and/or cognitive dysfunction, consistent with the diagnoses given; and

C. Impairment in occupational functioning due to those psychiatric symptoms. To address medical necessity in the context of varying patient needs, this impairment in functioning is divided into two subcategories.

1. Patients in the middle phases of treatment (six one-hour sessions over six weeks) who typically have fluctuating degress of impairments in functioning as evidenced by a specific clinical description. GAF scores, fluctuate but may exceed 71 for the six-week period prior to review. Such scores are frequently considered typical and appropriate within the context of the progressive response to treatment and the treatment plan.

Among the factors considered in making a determination on the continued medical necessity of treatment in this phase are the frequency and severity of previous relapses, level of stressors, and other relevant clinical indicators.

2. Patients in the final and consolidation phases of treatment (six one-hour sessions over twelve weeks) who typically have GAF scores above 71. Such scores are frequently considered typical and appropriate within the context of the progressive response to treatment and the treatment plan.

However, if the level of functioning has progressed to the point that the patient has sustained a GAF score above 71, serious consideration should be given to the medical necessity of continued treatment. Options to consider are: a) termination of treatment or b) reduction in the level and/or type of treatment previously given.

Note: Medication management with a visit every eight weeks for 15-20 minutes may be necessary indefinitely and should be reviewed on a case-to-case basis.

As above, the factors considered in making a determination about the continued medical necessity of treatment in this phase are the frequency and severity of previous relapse, level of stressors, and other relevant clinical indicators. The therapist should be able to explain whether the therapeutic modality being utilized will shift (and if not, why) when there has been sustained improvement as measured in part by a GAF score over 71.

II. Intensity of Services Indicators

Continued outpatient psychotherapy treatment requires the presence of each of the following indicators.

A. An update of the medically necessary and appropriate treatment plan specific to the patient's impairment in functioning and DSM-IV psychiatric symptoms, behavior or cognitive dysfunctions.

B. The treatment plan update must identify:

1. all changes in target specific DSM-IV psychiatric symptoms, behavior, and cognitive dysfunction being treated;

2. all modifications, if any, in biologic, behavioral, psychodynamic or psychosocial framework(s) of treatment for each psychiatric symptom/cluster and/or behavior;

3. all changes in the specific and measurable goals for treatment specified in terms of symptom alleviation, behavioral change, cognitive alteration, psychodynamic change, or improvement in occupational functioning;

4. all modifications in treatment methods in terms of:

- . treatment framework or orientation,
- . treatment modality,
- . treatment frequency, and
- . estimate of treatment duration;

5. progress in measurable, target criteria used to identify both interim treatment goals and end of treatment goals to determine 1) treatment is progressing and 2) goals have been met and treatment is no longer needed;

6. alternative plan to be implemented if patient does not make substantial progress toward the given goals in a specified period of time. Examples of an alternative plan are a second opinion or introduction of adjunctive or alternative therapies.

ADULT PSYCHIATRIC PARTIAL HOSPITALIZATION CRITERIA

Preamble - Medical necessity is defined as "services and supplies by a provider to identify or treat an illness that has been diagnosed or suspected. They are:

a. consistent with:
(1) the diagnosis and treatment of a condition; and
(2) standards of good medical practice;
b. required for other than convenience; and
c. the most appropriate supply or level of service.

When applied to inpatient care, the term means: "the needed care cannot be safely given on other than an inpatient basis."

The purpose of this protocol is to define and clarify criteria for when partial hospitalization for psychiatric treatment meets the above definition for medical necessity.

PRINCIPLES FOR CERTIFICATION

When a patient has a psychiatric disorder that requires professional evaluation and treatment, he/she should be treated at the least intensive outpatient level appropriate for the condition prior to partial hospital/day treatment; unless there is compelling evidence to the contrary.

I. Criteria for Admission

Medical necessity for psychiatric partial hospitalization treatment must be based on meeting the conditions defined under Section A, 1 and 2 (both must be met) and either 3 and 4, as well as meeting all of the criteria defined under Section B.

A. Severity of Need

1. Patient must have a mental illness. Mental illness is defined as Axis I psychiatric disorder that, by accepted medical standards, can be expected to improve

significantly through medically necessary treatment and therapy.

2. There is clinical evidence that documents that a less intensive outpatient setting is not appropriate at this time and/or a day treatment program can safely substitute for or shorten a hospital stay.

3. There is clinical evidence that the patient would be at risk to self or others if he were not in a partial hospitalization program. Additionally:

a. Patient can contract for safety in a structured environment under clinical supervision for part of the day and has a suitable environment for the rest of the time; or

b. The patient is believed to be capable of controlling this behavior and/or seeking professional assistance or other support when not in the partial hospital setting.

4. As a result of the patient's mental disorder there is an inability to adequately care for one's physical needs, representing potential serious harm to self.

B. Intensity of Service

1. In order for a partial hospital program to be safe and therapeutic for an individual patient, professional and/or social supports must be identified and available to the patient outside of program hours, and the patient must be capable of seeking them as needed.

2. The patient's condition must require intensive nursing and medical intervention for more than three (3) hours per day and for more than two (2) days per week.

3. The individualized plan of treatment for partial hospitalization requires treatment by a multidisciplinary team. A specific treatment goal of this team is improving symptoms and level of functioning enough to return the patient to a lesser level of care.

II. Criteria for Continued Stay

In addition to continuing to meet the criteria given above for admission, patients must meet A and B.

A. Progress notes for each day that patient is in a partial hospital/day treatment program documenting the provider's treatment, the patient's response to treatment, and the persistence of the problems that necessitated the admission to the partial hospitalization program, despite treatment efforts, or the emergence of additional problems consistent with the admission criteria.

B. Documentation that attempts at therapeutic re-entry into a less intensive level of care have or would result in exacerbation of the psychiatric illness to the degree that would warrant the continued need for partial hospitalization services.

PROTOCOL HISTORY:
Passed: 9/01/92
Effective: 9/22/92
Revised: 11/19/02
Effective: 12/10/02

OUTPATIENT PHYSICAL AND OCCUPATIONAL THERAPY PROTOCOL GUIDELINES

General Therapy Guidelines

1. Therapy evaluations must be provided by licensed physical and/or occupational therapists. Therapy

evaluations may not be performed by therapy assistants or other medical providers.

2. For worker's compensation patients, physicians may not provide or bill for physical therapy services without employing a licensed therapist to evaluate and supervise treatments.

3. Therapy treatments may be provided by licensed therapy assistants ** as directed by the licensed therapist or by therapy aides under supervision of the licensed therapist.

* A facility may not employ more than two licensed assistants per therapist.
** Certified Occupational Therapy Assistants are nationally certified to provide care under the direction of licensed occupational therapists.

4. A course of physical and/or occupational therapy treatment will consist of nine (9) treatments or less. In those few instances where further treatments need to be given, the following format will be followed:

a. The therapist will provide the rationale for continuation of treatment to the employer/insurer.

b. The insurer, usually in correlation with a medical specialist, will make a judgment concerning the medical necessity for further treatment. He will inform the therapist within ten (10) days of receipt of the written or verbal request for continued treatment whether therapy treatment will be reauthorized.

5. Therapy evaluations must identify patient problems and objective measurements of physical or work-skills deficits. These objective measures should be as specific as is possible for the diagnosis or patient problem.
Example: Patient diagnosis of rotator cuff strain.

Appropriate

ROM flexion 160, abduction 90, int rotation 45, ext rotation 60.
Unable to reach or lift above shoulder height; able to lift up to 25 lbs from floor to waist.

Inappropriate

ROM limited in all planes.

Unable to lift secondary to pain.

6. Therapy treatment plans must be problem oriented.

7. Therapy evaluations should identify subjective complaints of pain or paresthesias, however, therapy treatments cannot be based solely on pain reduction. Evaluations must identify specific treatment plans and relate treatments to improving objective deficits and patient problems.

8. Frequent reassessment of progress towards improving objective deficits must be done and documented. Timing of reassessment is based on frequency of treatment, but should occur no less than every nine (9) sessions. Revision of problem lists, goals, and treatment plans must be documented at this time.

9. Continuation of treatments cannot be based solely on presence of continued pain symptoms. If objective measures have failed to improve, or have plateaued, treatments should be placed on hold or discontinued. If treatments are stopped, the referring physician must be notified; employer or responsible paying party may also be notified, if appropriate.

10. All treatment sessions and tests must be documented in writing. Daily treatment notes must:

a) identify type of treatment.
b) note patient response to treatment in subjective and objective terms.
c) identify any change in treatment plan and reasoning for change; e.g., stopping ultrasound treatment because of diminished tendonitis symptoms and increased ROM.

d) all assisting personnel notations must be co-signed by the supervising therapist.

11. Most of the treatment protocols anticipate healing and return to work will occur during the first four weeks after injury. There are some patients whose rehabilitation will take longer than the anticipated time frame because of the severity of their injury or the occupational demands of their job. Continuance of the therapy program will be according to the guidelines noted above.

THERAPY PROTOCOLS

LOW BACK MUSCULAR INJURY

...as delineated on page 37 of the Medical Advisory Board Protocols.

CERVICAL MUSCULAR NECK INJURY

...as delineated on page 5 of the Medical Advisory Board Protocols.

CARPAL TUNNEL SYNDROME

(Appendix from pp. 2-3 of the Medical Advisory Board Protocols.)

Non-operative Intervention

1. Appropriate Interventions:
   a) ROM and strenghtening exercises
   b) splint fabrication
   c) assessment of job skill levels for RTW
   d) instruction in work activities modifications or simulation of work activities
   e) patient education

2. Inappropriate Interventions:
   a) exclusive use of passive modalities

3. Extenuating Services:
   a) prolonged onset of symptoms prior to referral

Post-Operative Intervention

1. Extenuating Circumstances
   a) post-operative complications
   b) delayed referral into therapy

2. Appropriate Interventions:
   a) ROM, simple strengthening exercises
   b) Splint fabrication
   c) Scar tissue/swelling management
   d) Assessment of job skill levels needed for RTW
   e) Instruction in work activities modifications or simulation.
   f) Patient education.

CERVICAL HERNIATED DISC

(Appendix from pg. 8, Medical Advisory Board Protocols)

Non-operative Intervention

1. Appropriate Interventions:
   a) ROM exercises for neck and upper extremity
   b) strengthening/endurance exercises for upper extremity
   c) trial of cervical traction; if beneficial, a prescription for a home unit is sought.
   d) short-term use of modalities for pain relief.
   e) patient education
   f) assessment of work skill levels for return-to-work
   g) modification/simulation of work activities.

2. Extenuating Circumstances:
   a) profound muscle weakness
   b) delayed referral into therapy.

Post-Operative Intervention

1. Extenuating Circumstances:
   a) profound muscle weakness
   b) delayed referral into therapy

2. Appropriate Interventions:
a) ROM exercises for neck and upper extremity
b) strengthening/endurance exercises for upper extremity
c) patient education
d) modification/simulation of work activities.

3. Inappropriate Interventions:
a) cervical traction
b) exclusive and/or prolonged use of passive modalities.

LUMBAR HERNIATED DISC

(Appendix from pp. 43-47, Medical Advisory Board Protocols)

Non-operative

1. Appropriate Interventions:
a) ROM exercises for trunk and extremities
b) strengthening/endurance exercises for trunk and extremities
c) short-term use of modalities for pain relief, in conjunction with active exercises
d) patient education
e) assessment of work skill levels for return-to-work
f) work simulation activities (when acute symptoms have subsided) or work-site modifications.
g) short-term trial TENS for chronic pain; if found to relieve symptoms, a referral for a home unit should be sought.

2. Inappropriate Interventions:
a) prolonged and/or exclusive use of modalities

3. Extenuating Circumstances:
a) delayed referral into therapy
b) profound muscle weakness (non-operative and post-operative)

Post-operative

1. Appropriate Interventions:
   As above, exceptions noted below.

2. Inappropriate Interventions:
   a) Use of passive modalities, including traction

NON-OPERATIVE SOFT TISSUE INJURIES:

SHOULDER SPRAINS, OVERUSE INJURIES, KNEE STRAINS, ANKLE SPRAINS

(Refer to appropriate Medical Advisory Board Protocols)

1. Appropriate Interventions:

   a) acute management of muscle spasms, pain, and/or swelling
   b) ROM exercises
   c) gait training w/assistive devices, as needed
   d) (as tissue healing progresses) strenghthening and endurance exercises
   e) proprioception and balance activities
   f) assessment of job skill levels; job simulation activities if significant deficits noted
   g) isokinetic tests and rehab if deficits noted.

2. Inappropriate Interventions:
   a) exclusive and/or prolonged use of passive modalities
   b) multiple computerized tests in any one week

3. Extenuating Circumstances
   a) further medical evaluation that changes diagnosis
   b) surgery
   c) delayed referral into therapy

MENISCAL INJURIES

(Appendix: Refer to appropriate Medical Advisory Board Protocols)

Non-Operative

1. Appropriate Interventions:
   a) ROM and strengthening exercises
   b) acute management of swelling and pain
   c) gait training with assistive devices, as needed
   d) isokinetic testing and rehab.
   e) assessment of work skill levels for return-to-work
   f) work skills simulation

2. Inappropriate Interventions
   a) prolonged and/or exclusive use of passive modalities

3. Extenuating Circumstances
   a) delayed referral into therapy
   b) surgery

Post-Operative

As noted above.

SYMPATHETIC DYSTROPHY

Appendix from pg. 40 of the Medical Advisory Board Protocols

1. Appropriate Interventions:

   a) ROM exercises (aggressive if done after nerve block)
   b) strengthening and endurance exercises
   c) short-term use of modalities
   d) patient education
   e) short-term trial of TENS; if beneficial, a home unit should be sought.
   f) assessment of work skills levels; simulation of work activities if deficits are found

2. Inappropriate Interventions
a) prolonged or exclusive use of modalities

3. Extenuating Circumstances
a) development of adhesive capsulitis
b) delayed referral into therapy
c) repeated nerve blocks with therapy after each procedure

THORACIC OUTLET SYNDROME

1. Appropriate Interventions:
a) postural exercises and correction
b) ROM exercises
c) strengthening and endurance exercises
d) patient education
e) assessment of work skills; simulation if deficits are noted.

2. Inappropriate Intervention:
a) prolonged or excessive use of modalities
b) traction

PROTOCOL HISTORY:
Passed 3/30/93
Effective 4/19/93

ACOUSTIC TRAUMA

TRAUMA TO THE EXTERNAL EAR

I. BACKGROUND

The common types of trauma to the external ear usually result from thermal, blunt or penetrating trauma causing damage to the auricle, external auditory canal, or tympanic membrane.

II. DIAGNOSTIC CRITERIA

A. Pertinent History and Physical Findings

Direct examination of the external ear and tympanic membrane and evaluation of hearing with an audiogram.

III. TREATMENT

1. Hematoma of the external ear, usually due to a direct blow, is treated by drainage of the hematoma which may be done with an 18 gauge needle and syringe or a small incision under local anesthesia followed by application of Vaseline gauze and fluffs between the external ear and mastoid, and a soft gauze bandage is wrapped around the head. The patient should be re-examined in 24 hours for reaccumulation. Time loss from work, 0 to 2 days.
2. Simple lacerations present no difficulty in management and may be sutured, and a bulky pressure dressing is applied. They are anticipated to heal. Time loss from work, none.
3. Exposed cartilage presents a special problem. Debridement and complete coverage of all cartilage are key principles, and torn cartilage should be repaired. These usually heal readily. Maximum time lost from work, only with the most serious injuries, five days.
4. Large auricular avulsions may need to be reanastomosed by an otolaryngologist or plastic surgeon. This will require follow-up visits. Loss of work may be minimal depending on the type of work, but maximum time lost from work, two weeks.

5. Large circumferential lacerations to the external auditory canal may lead to stenosis of the canal and these mandate referral to an otolaryngologist. Loss of time from work, 1 to 2 days.

6. Burns to the auricle require removal of devitalized tissue and antibiotic ointments to protect the underlying cartilage. Time lost from work, none.

7. Chemical burns may follow exposure to acids or alkali. Primary treatment consists of immediate irrigation with several liters of water, identification of the toxic chemical and should be treated primarily as a burn. No loss of work anticipated. No time lost from work.

8. Simple perforation of the tympanic membrane generally heals in four to six weeks, some use of antibiotics if there are definite signs of contamination. Failure to heal will require an ENT referral. Patient to be instructed to keep water out of ear until perforation has healed. No loss of time from work anticipated.

IV. ANTICIPATED OUTCOME

Full Recovery.

INJURY TO THE MIDDLE EAR

I. BACKGROUND

The middle ear cavity is connected with the nasal pharynx by the eustachian tube and is intimately related to injury or diseases of both structures.

The primary trauma to the middle ear is barotrauma due to changes in barometric pressure and blunt trauma. Severe injury can disrupt the ossicular chain with conductive hearing loss or cause a perilymphatic fistula resulting in vertigo and sensorineural hearing loss.

Tympanic membrane perforations secondary to thermal burns as well as slag-bur injury and perforations from direct trauma to the ear drum from foreign body.

II. DIAGNOSTIC CRITERIA

Examination of the ear looking for retraction, or perforation of the tympanic membrane as well as evidence of effusion or hemotympanum. A neurological examination should be performed looking for evidence of vestibular disfunction (nystagmus). Patient should have an audiogram and if clinically indicated (vertigo) a fistula test can be performed by an audiologist, but only after examination by otorhinolaryngologist.

III. TREATMENT

1. Antibiotic if URI is present, oral steroids may reduce eustachian tube edema. No loss of time from work.
2. Patient with vestibular findings requires an emergency ENT referral. There may be no time lost from work, but this would depend on the ENT referral, including the severity of the vertigo and the type of work the patient is involved with.

IV. ANTICIPATED OUTCOME

This depends on how much damage has occurred.

TRAUMA TO THE INNER EAR

I. BACKGROUND

Trauma may result from blunt injury causing temporal bone fracture, blast injury, noise exposure or toxic injury. Vestibular, cochlear or facial nerve function may be affected.

II. DIAGNOSTIC CRITERIA

Radiologic evaluation with blunt trauma is of limited value. An MRI or CT Scan may show the fracture. The physical examination may reveal the discolored tympanic membrane and may show the fracture through the external canal. The neurological examination may reveal facial paralysis, perforation of the tympanic membrane with CSF leak. The patient should be examined for evidence of hearing loss (Hearing Test) or vestibular dysfunction (ENG).

III. TREATMENT

1. CSF Leak. One should watch for a cerebral spinal fluid leak and if this persists may require a neurosurgical consultation and repair, usually a combined procedure performed by an otolaryngologist and neurosurgeon. The use of antibiotics is controversial, more recently it is felt that they are not useful in this situation.

2. Hearing Loss.

a. Nerve hearing loss, there is no surgical treatment although amplification devices may be required.

b. Conductive hearing loss.

1. Repair of tympanic membrane perforation. Time lost from work with surgery, maximum one week.

2. Repair of disrupted ossicles. Time lost from work with surgery, maximum two weeks.

3. Facial paralysis may require nerve repair or a form of re-animation procedures of the facial muscles. Time lost from work would be variable in this case, but not more than three days.

4. Vestibular Injury.

a. Vestibular suppression medications such as Antivert, Valium or Klonopin.

b. If the vertigo becomes disabling and persists after six months of treatment with the above medications, then vestibular destructive surgery either with labyrinthine destruction or vestibular nerve section may be required. Loss of time from work would be four days following surgery.

IV. ANTICIPATED OUTCOME

This depends on how much damage has occurred.

WORK-RELATED HEARING IMPAIRMENT DUE TO NOISE

I. BACKGROUND

Hearing impairment due to noise may occur in the workplace. An effort has been made by the American Academy of Otolaryngology Committee on Hearing and Equilibrium and the American Council of Otolaryngology Committee on the medical aspects of noise.

II. DIAGNOSTIC CRITERIA

A. Pertinent Historical and Physical Findings.

The history consists of impairment of hearing. The Hearing Conservation Program requires employers to monitor noise exposure levels in a manner that will accurately identify employees who are exposed to noise at or above 85 decibels (dB) averaged over eight working hours. The exposure measurement must include all noise within an 80 dB to 130 dB range and must be taken during a typical work situation. Audiometric testing must be made available to all employees who have average exposure levels over an eight-hour period of 85 decibels.

III. TREATMENT

Hearing protectors must adequately reduce the severity of noise in each employees' work environment.

The percentage loss is to be evaluated by an Otolaryngologist and Audiologist.

Protocol History:
Passed: 3/30/93
Effective: 4/19/93
Revised: 11/19/02
Effective: 12/10/02

EPIDURAL NERVE BLOCKS AND EPIDURAL STEROID INJECTIONS IN THE MANAGEMENT OF LOWER EXTREMITY PAIN

EPIDURAL INJECTIONS

A. Background

Epidural injections of local anesthetic and/or steroid may be considered for the treatment of radicular pain symptoms secondary to disk herniation or postsurgical radicular pain. Epidural injections do not alter the course of the underlying process, but may offer effective pain relief in selected patients. Epidural injections may be performed in the cervical, thoracic, lumbar, and sacral regions. In patients with distorted anatomy due to surgery or pathology, fluoroscopic guidance may be necessary to insure proper delivery of the drug to the target area. The injections should be delivered into the area of the known pathology using midline, paravertebral, or transforaminal approaches. Caudal steroid injections should only be used for patients with leg pain of sacral origin, or in whom direct access to the lumbar regions is impossible.

Local anesthetic epidural blockade may be useful in conjunction with aggressive physical therapy or manipulation of a painful limb associated with joint stiffness or limited range of motion. Lumbar sympathetic blocks are more appropriate for evaluating and treating complex regional pain syndromes, as they provide a more selective evaluation by providing a discrete sympathetic block.

B. Diagnostic Criteria

1. Pertinent History and Physical Findings

Pain in the lower extremities associated with injury to the lumbar or sacral area, most commonly following failed post-operative disk surgery.

2. Appropriate Diagnostic Tests and Examinations

Neurological examination of the lower extremities may or may not be abnormal. Appropriate testing of the lumbosacral area, either by non-invasive techniques such as CT scan, MRI scan, EMG, or invasive myelography.

C. Treatment

1. Outpatient Treatment

These are carried out as an outpatient, in an ambulatory patient setting. Patients are often positioned in the seated, lateral, or prone positions. If local anesthetics are introduced into the epidural space, proper monitoring of the patients vital signs is needed, to include electrocardiography, blood pressure measurement, and pulse oximetry. Conscious sedation may be employed but is seldom needed for most patients. Equipment for the management of inadvertent intravascular injections causing toxicity must be immediately available. Emergency equipment and supplies include oxygen, ventilatory tools, laryngoscope, endotracheal tubes, intravenous access supplies, and vasopressors. Most patients receiving epidural local anesthetics will encounter a decline in blood pressure and occasionally bradycardia. Vasopressors such as ephedrine and phenylephrine should be available, in addition, atropine should be immediately available.

2. Toxicity

Local anesthetic toxicity can be avoided by injecting small volumes of anesthetic into the epidural space and frequent aspiration of the needle to assess for intravascular placement of the needle. Test dose injections using a small dose of local anesthetic and epinephrine are helpful to assess intravascular injection or inadvertent subarachnoid injection. Cardiovascular and ventilatory support may be needed even with test dose injections, and all appropriate precautions must be taken. Steroid injections in the

absence of epidural local anesthetic do not require hemodynamic monitoring. Post injection monitoring of vital signs are required for at least one hour following epidural local anesthetic injections, and possibly longer.

3. Duration of Treatment

Epidural injections are primarily intended as a short-term pain intervention for the initial radicular pain problem. Using a long-acting steroid preparation, such as methylprednisolone acetate or triamcinolone hexacetonide, injections should not be performed at intervals shorter than two weeks, but preferably at one month intervals. Steroid injections should not exceed three in a six month time frame, and not more than four in a twelve month period.

Protocol History:
Originally “Caudal Epidural Blocks . . . ”

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Effective: 6/30/98
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WORK HARDENING PROTOCOLS

I. Definition

Work hardening is a highly structured, goal oriented, individualized treatment program designed to maximize the person's ability to return to work. Work hardening programs are multidisciplinary in nature with the capability of addressing the functional, physical, behavioral, and vocational needs of the person served. Work hardening provides a transition between the initial injury management and return to work, while addressing the issues of productivity, safety, physical tolerance, and work behavior. Work hardening programs use real or simulated work conditions in a relevant work environment in conjunction with physical conditioning tasks if necessary. The activities are used to progressively improve bio-mechanical, neuromuscular, cardiovascular-metabolic, behavioral, attitudinal, and vocational functions of the person served.

II. Introduction

Guidelines have been established that define the nature, character, time duration and cost of physical/occupational therapy treatments. To briefly summarize, up to a total of nine (9) physical/occupational therapy treatments will be paid by an insurer/employer for services given to an injured worker. The treatment program can include therapy treatments embodied in the concepts of work simulation and work conditioning. The services will be compensated on a pay-per-visit basis (according to the fee schedule). There will be no additional charge for multiple treatment modalities utilized during the therapy services.

Work hardening programs are in use in the State of Rhode Island at the present time. As noted, the purpose of the work hardening program is to return the worker to his/her own job or a modified version of that job. The program can be utilized when other treatment (medical, PT/OT, etc.), has not been successful. The function of the work hardening program is to attempt to bridge the gap

between the patient who has some residual difficulties and the requirements of the job. In addition, the work hardening program may well recondition the patient and prevent reinjury. Work hardening is a time-consuming and costly procedure, and careful patient selection is of the greatest importance.

III. Protocol

The following represents the general outline (protocol) for the evaluation of candidates for work hardening and for implementation of treatment.

a. A request for work hardening may be made by the treating physician or the insurer/employer.

b. All requests for work hardening will be forwarded to the Medical Advisory Board Administrator. The Administrator shall forward copies of the request to the appropriate parties. Appropriate forms and available clinical information will accompany the request.

c. The Administrator will promptly refer the work hardening request to an approved provider for evaluation and, if indicated, treatment. The referral will take into consideration factors of patient preference, Employer/Insurer preference, geographic locale, and availability of the facility for prompt evaluation. The Employer/Insurer will have the option to refer the injured worker to a specified center for re-evaluation and treatment if a program of work hardening is recommended. If there is a Preferred Provider Network (PPN) in place that includes work hardening facilities, the employer has the right to choose from the PPN.

d. The work hardening facility will submit a copy of the evaluation to the referring insurer/employer and the Medical Advisory Board within one week of the evaluation. This evaluation should include:

1. functional work capacity
2. musculoskeletal status
3. behavioral and attitudinal status as it relates to the work injury

4. vocational status
5. cognitive/perceptual status
6. medical status

The evaluation should document a benchmark from which to establish the initial treatment plan and/or the physical/functional/vocational disposition.

e. The treatment facility will submit the initial treatment plan.

Information will include:

1. name of the case manager
2. estimated time frame for treatment
3. estimated cost of services

f. It is anticipated that work hardening programs will include:

1. the practice, modification, and instruction of component work tasks through real or simulated work
2. the development of strength and endurance of the person related to the performance of work tasks
3. the education to teach safe job performance to prevent reinjury
4. the assessment of specific job requirements in relation to program goals through work site evaluation and/or job analysis
5. the provision of ergonomic recommendations to the employer which would facilitate and optimize the successful and safe return to employability
6. communication with the employer as to the person's present state
7. the provision of a mechanism to promote responsibility and
8. the identification of the person's transferable skills to facilitate return to work
9. the development of behaviors and attitudes that will improve the persons ability to return to work or to benefit from other rehabilitation efforts.

g. A brief, weekly report should identify progress to date toward goals of treatment. Changes in objective measures should be noted, e.g., amount of weight that can

now be lifted. This report should be sent to employer/insurer.

h. Work hardening programs may be conducted three to five days per week for a period of up to four weeks. Prior authorization will be required to continue treatment beyond four weeks.

i. A full reassessment of all objective measures must be completed at the end of the program or at the end of four weeks. If approval for continued treatment beyond the initial four weeks is requested, this reassessment must be forwarded to the insurer/employer. Rationale for continued treatment, proposed treatment extension, and cost of services must also be identified.

j. An exit/discharge summary shall be submitted to the referring physician, insurer/employer, and the Medical Advisory Board within seven working days of the exit/discharge date. This summary shall include:

1. reason for program termination
2. clinical and functional status
3. recommendations for return to work
4. recommendations for follow-up services

The final reassessment may be used in lieu of a separate summary if all of the information above is contained within.

k.The provider shall file a work hardening outcome survey with the Medical Advisory Board at three, six, and twelve month intervals, following completion of treatment. This survey shall be on a form provided by the Medical Advisory Board.

PROTOCOL HISTORY
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Effective: 7/10/95

PROTOCOL FOR THE MANAGEMENT OF GROIN HERNIAS

I. Background

Hernia is defined as a weakness in the supporting structures through which a contained organ may protrude. A hernia may be described in terms of a weakness or actual opening or defect in an enclosing layer. However, the organ need not be present within the weakness for the hernia to exist.

Groin hernias can be sub-classified into:

1. Inguinal
2. Femoral

Hernias may further be classified into:

1. Reducible
2. Non-reducible - incarcerated
3. Strangulated - where there is compromise to the blood supply to the protruding organ

Other abdominal wall or ventral hernias include:

1. Incisional/Ventral - through a prior surgical incision in the abdominal wall
2. Umbilical - through a defect at the umbilicus or belly button
3. Epigastric - defect through the linea alba above the umbilicus
4. Spigelian - through a defect at the lateral border of the rectus muscle
5. Lumbar - defect through the lateral abdominal wall

Hernias may be congenital or secondary, that is, they develop later in life. The etiology of a hernia that develops secondarily in later life is usually trauma. However the traumatic explanation may not be entirely clear. In some instance, the patient may be able to pinpoint the precise event, such as lifting a heavy object,

and suddenly feeling a tear or severe pain in the groin.

In other cases, the patient may only recognize a gradual bulge over years of hard work.

II. Symptoms of Hernias

1. Asymptomatic

a. Many hernias are discovered only on routine physical examination, and patients have no symptoms referable to them.

2. Symptomatic

a. Noticeable, painless bulge in the groin which may or may not be intermittent.

b. Noticeable, painful bulge in the groin which may or may not be intermittent.

1. Pain may be quite severe initially, but usually subsides to a dull ache unless incarceration or strangulation occurs.

c. Severe generalized abdominal pain often associated with nausea and vomiting, abdominal distention, and a non-reducible bulge in the groin – which suggests incarceration and/or strangulation, causing bowel obstruction.

d. In the obese patient, actual bulge can be missed on examination, but the patient may present with symptoms and signs of bowel obstruction with no other etiology.

III. Physical Signs

1. Hernia may not be detectable on physical examination. This is frequently the case with baby hernias, or in obese patients.

2. The defect and/or bulge can be felt in the inguinal canal. For a reducible hernia, often the patient must be in the upright position and strain, to increase the intra-abdominal pressure for the hernia to be detected. A dilated external ring does not, in and of itself, constitute the diagnosis of a hernia.

3. Signs of bowel obstruction, such as abdominal distention and tenderness, suggests incarcerated and/or strangulated hernia, in the absence of another cause.

IV. Differential Diagnosis of Groin Masses

1. Testicular torsion
2. Acute femoral lymphadenitis
3. Soft tissue mass, such as lipoma

V. Treatment

1. Non-operative

a. External device or truss to maintain reduction of the hernia to prevent incarceration and/or strangulation. This is most helpful for large ventral hernias or incisional hernias and of little help in groin hernias. It does not treat the hernia, it only helps to prevent complications resulting from the hernia.

2. Operative Repair

a. This should be scheduled in a timely fashion after diagnosis.

b. If there are signs or symptoms of incarceration and/or strangulation, surgery should be scheduled more urgently or emergently (usually within 24 hours).

c. Out-patient

1. Conventional surgical treatment is performed under local, neuroleptic (IV sedation and local anesthesia), general anesthesia, spinal or epidural anesthesia.
2. Laparoscopic repair usually requires general anesthesia.
3. If strangulation has occurred, the patient may require conversion to a general anesthetic with full laparotomy with resection of the involved organ. The patient may need admission to the hospital following

this procedure.

Most surgeons performing hernia repairs today use a tension free technique which reduces pain, reduces the risk of recurrence, and enables the patient to return to work much quicker. A tension free repair can be performed either using an open technique or a laparoscopic technique. The type of repair is usually based on the patient's anatomy, as well as the surgeons preference and expertise.

Most groin hernias can be repaired on an outpatient basis. If incarceration and/or strangulation occurs, and conversation to a laparotomy is required or a bowel resection is required, admission to the hospital is usually required, and recovery is usually longer.

VI. Complications Resulting from Repair of the Hernia

1. Infection—rare
2. Wound Hematoma/Seroma
3. Nerve entrapment with hypesthesias or numbness
4. Recurrence – early or late
5. Testicular ischemia/Infarction – rare

VII. Follow-Up

1. Patients are usually treated as outpatients with initial postoperative visit one to two weeks following the surgery. Patients may return to work at 2 weeks. For individuals who routinely lift greater than 100 lbs., 3 weeks recovery is generally required. Follow up visits beyond 2-3 weeks are generally needed if complications have occurred. Patients who undergo bilateral hernia repair, in general, should not require longer recuperative time.

VIII. Precautions to Prevent Recurrence from Work-Related Hernias

1. Cessation of smoking
2. Weight reduction
3. Muscle strengthening exercises, which usually do not require physical therapy
4. Learning proper techniques in lifting and bending

Protocol History:

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ACUPUNCTURE PROTOCOL

The Medical Advisory Board recognizes that, for certain medical conditions, including postoperative pain or nausea and dental pain, acupuncture treatments may be efficacious in the cure, relief, or rehabilitation of the injured worker. Acupuncture treatments may also be efficacious for injured workers who have not responded to treatment options as specified in the_protocol; however, the medical literature does not strongly support the use of acupuncture for most chronic musculoskeletal conditions.

In certain specific instances, acupuncture may be utilized on a trial basis when:

A) a trial of acupuncture is recommended, in writing, by the treating physician. The treating physician cannot also be the provider of the service, and the trial of acupuncture treatments will not exceed 6 visits,

and

B) there is clear and irrefutable documentation that the patient has not responded to reasonable medical, surgical, and chiropractic services, as specified in the appropriate protocols, and there is objective evidence of residual disability or incapacity,

and

C) any further authorization of acupuncture treatments will require independent, objective evidence of the efficacy of the treatment(s) and may, at the direction of the Workers' Compensation Court, require a concurring opinion provided by an impartial medical examiner.

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DIAGNOSTIC TESTING PROTOCOLS

Guidelines for the Ordering of CT Scans, MRI Scans, EMG, Bone Scans, Myelograms & Angiograms

I. CT Scans

A. A CT scan is appropriate for an acute head injury when there is need to rule out an associated acute cerebral condition.

B. A CT scan is appropriate for low back injuries with appropriate neurologic deficits which have not responded to conservative treatment after a period of 4 to 6 weeks.

C. In the event of an eye injury, orbital CT scans may be ordered by an ophthalmologist in the presence of foreign body or orbital injury.

D. Shoulder injuries may require a CT scan, but this should be ordered by an Orthopedic Surgeon.

E. A CT scan may be ordered by an Orthopedic or Neurosurgeon in a case where a patient has undergone a 2nd or 3rd surgical procedure and in which a lumbar fusion is being considered.

F. A repeat CT scan may be ordered if there has been a marked progression of signs and symptoms but should not be ordered just for routine follow-up purposes.

G. CT scans may not be ordered for routine follow-up purposes. In addition, any follow-up CT scan may only be done with the permission of the employer/insurer.

II. MRI Scans With or Without Contrast

Indications

A. Cervical injuries in which a cervical disc is suspected, generally performed without contrast. (to be ordered generally by Orthopedic Surgeon, Neurologist, Neurosurgeon, Physiatrist, or Rheumatologist).

B. Acute knee injuries with suspected (1) meniscal injuries or (2) collateral ligament injuries (to be ordered only by an Orthopedic Surgeon, Physiatrist or Rheumatologist).

C. In lumbar disc injuries, a CT scan may be a reasonable alternative. Generally both studies should not be performed.
(to be ordered generally by Orthopedic Surgeon, Neurologist, Neurosurgeon, Physiatrist, or Rheumatologist).

D. In metatarsal fractures, an MRI is rarely indicated (can be ordered only by an Orthopedic Surgeon/Hand Surgeon, Physiatrist or Rheumatologist).

E. Thoracic spine injuries with any indication of damage within the canal (to be ordered generally by Orthopedic Surgeon, Neurologist, Neurosurgeon, Physiatrist, or Rheumatologist).

A repeat MRI study is indicated only if:

1) There are clear clinical or radiographic signs of significant progression.
2) A repeat study may be useful after surgery if a patient's condition fails to improve. In this situation, contrast material should be used to differentiate between further disc material and scar tissue.

F. Waters view is frequently done to determine if there is a suspicion of a metallic foreign body of the orbit. In

the infrequent occasion in which there is a high level of suspicion of metallic foreign body in the orbit, a CT scan of the orbit can be done.

G. MRI can be utilized for shoulder injuries (to be ordered only by an Orthopedic Surgeon, Physiatrist or Rheumatologist).

H. An MRI of a peripheral nerve disorder may only be ordered by a specialist (Orthopedic Surgeon, Neurologist, Neurosurgeon, Physiatrist or Rheumatologist) and only with the express consent of the insurer.

MRI scans may not be ordered for routine follow-up purposes. In addition, any follow-up MRI Study may only be done with the permission of the employer/insurer.

III. Bone Scans

A Bone Scan may be ordered for the following reasons:

A. Suspected tumor involvement of the bony part injured.

B. Suspected infection of the bony part injured.

C. Occasionally, where x-rays have failed to show a fracture.

D. In some cases of acute knee injuries. (should be ordered by an Orthopedic Surgeon)

IV. Myelograms

A Myelogram may be ordered for the following reasons:

A. When there are true signs of cervical disc and one has been demonstrated by MRI Scan and the patient is a surgical candidate.

B. In a low back injury where a disc has previously been demonstrated by CT Scan or MRI Scan and who has not

responded to conservative treatment and the patient is a surgical candidate.

C. Thoracic injury would follow the same as above.

D. Any spinal fracture or subluxation in which there is suspected cord compression.

V. Angiograms

A. In traumatic cervical injuries in which there is a suspicion of damage to the vertebral or carotid arteries.

B. In thoracic outlet syndrome, if vascular compression is suspected.

VI. Electromyogram and Nerve Conduction Studies

Neurophysiological studies (EMG and CV studies) are frequently utilized diagnostic techniques for the identification and assessment of disorders affecting the nerve roots (radiculopathy), peripheral nerves, neuromuscular junction and for the diagnoses of diseases of the muscles. These techniques are generally not useful for the diagnosis of disorders of the central nervous system.

The aforementioned electrophysiological techniques can be utilized for the diagnosis or evaluation of several conditions that are associated with an injury at work. These include (I) radiculopathy in association with disc disease, with spondylitic disease, or with other nerve root conditions, (II) peripheral nerve injury.

A. Radiculopathy - EMG studies are employed to detect the presence of nerve root injury. This study is most useful after a period of four weeks and is generally not indicated prior to that time.

1. If the initial study is negative for nerve root irritation and/or damage, a repeat study may be indicated after a six month time interval. However, a repeat study can be performed prior to six months if surgery is under consideration or if requested by an attending physician.

Follow-up EMG studies may be required (on not less than a yearly basis), for the purpose of re-evaluation of an active problem requiring ongoing treatment (prior to MMI).

2. If the study is abnormal, a repeat study may be indicated (after six months) if:

a. There is a significant change in the patient's clinical status.

b. If surgical treatment has been performed and the desired clinical result has not been achieved.

c. If repeat surgical treatment is being contemplated or if the study is requested by the attending physician (radiculopathy).

3. Conduction velocity studies can be useful in evaluating for the presence of radiculopathy as well.

a. In testing for radiculopathy, study of a motor nerve, a sensory nerve and study of a "late response" (usually F wave in the upper extremity and the H response in the lower extremity) may be of significant value in the diagnosis of a radiculopathic disorder. H response may be performed in the opposite extremity as well.

b. In addition, studies may need to be performed to rule out an associated peripheral nerve lesion, and the appropriate format for study is described below (see "II. Peripheral Nerve Injury").

B. Peripheral Nerve Injury

1. Studies can include EMG and CV studies to evaluate for the presence of a peripheral nerve injury.

a. Acute injury - EMG and nerve conduction studies are the most useful after four weeks (approximately) and are generally not indicated prior to that time. However, EMG and nerve conduction studies can be performed prior to that time if

(1) surgical treatment is under consideration or

(2) if requested by an attending physician.

b. Chronic dysfunction - In general, a single study (EMG and CV) is sufficient to evaluate for a chronic nerve disorder (carpal tunnel, ulnar nerve disorder or other nerve entrapment condition). A repeat study may be performed after three or four months if specific treatment (for example, surgical release procedure) is contemplated or if requested by the attending physician. Follow-up studies may be performed after this time but not more frequently than yearly for purpose of re-evaluation of an active problem requiring ongoing treatment (prior to MMI).

2. Concerning the issue of nerve conduction studies and the appropriate nerve(s).

a. Conduction velocity studies are useful for the study of one or more nerves that are clinically suspect in the affected extremity.

b. Testing of an uninvolved nerve in the same limb such as the ulnar nerve in a patient with, for example, a median nerve disorder (carpal tunnel) is useful. Studies of the contralateral and presumably normal nerve may also be of diagnostic importance.

c. On occasion, the testing of a motor nerve, a sensory nerve, and a "late response" study may be performed in a non-affected extremity to evaluate for the presence of a coexistent systemic peripheral nerve disorder (e.g. Diabetic Peripheral Neuropathy).

VII. Evoked potential studies are not useful for diagnosis and management of peripheral nerve disorders.

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TEMPOROMANDIBULAR JOINT DISORDERS

I. BACKGROUND

Temporomandibular Joint Disorders (TMD) has been defined as a collective term embracing a number of clinical problems that involve the musculature and/or the temporomandibular joint itself. Temporomandibular Joint Disorder (TMD) has been used to refer to a group of conditions that are often called TMJ by the public. Unfortunately, this imprecise term, TMJ, has been used by physicians and dentists as well to describe all of the myriad of pain problems that patients experience in association with the head, neck, jaws and muscles in this anatomical region of the body. This imprecision in the use of terms has led to a great deal of confusion. In an attempt to clarify this situation, the following definitions are presented:

There are two distinct categories of TMD:

1. Masticatory and cervical muscle fatigue/spasm/pain and dysfunction.

This is a specific term used to describe painful and debilitating extra-articular maladies of the head, neck, and jaws. These problems result from the abuse of the masticatory and cervical musculature secondary to abnormal parafunctional habits such as bruxism and clenching of the teeth in response to stress and/or myofascial pain. However, if not controlled or eliminated, these problems could, in some cases, cause intra-articular pathology.

2. Intra-articular biomechanical dysfunction.

This is a specific term used to describe the consequences of the pathologic entities that occur to the intra-articular structures of the TMJ.

The important distinction is that masticatory and cervical muscle pain and dysfunction is not primarily centered in the joint itself, whereas biomechanical dysfunction of the TMJ is directly related to the anatomy and associated pathology of the joint.

The health consequences of TMD can be devastating. Dependence on pain medications, decreased productivity, and disability are common. Most patients who have extra-articular TMD, fortunately, can be successfully treated and rehabilitated with a combination of rest, medication, change in habits, and an orthotic appliance. However, those patients whose cause of TMD is intra-articular pathology often cannot be treated successfully without surgical intervention.

II. DIAGNOSTIC CRITERIA - Masticatory and Cervical Muscle Pain And Dysfunction

A. Pertinent Historical and Physical Findings

Intermittent, generalized unilateral or bilateral dull, aching preauricular or auricular pain is usually the first symptom. Often this leads the patient to their physician or an otolaryngologist. This pain will frequently migrate to the temporal, cervical, and occipital regions.

Masticatory and cervical muscle origin pain (extra-articular) differs from the pain associated with intra-articular biomechanical dysfunction in that with intra-articular pain the pain is directly localized to the affected joint, rather than generalized to an area as is the pain associated with the extra-articular conditions. Also, with the intra-articular conditions, the pain is constant each time the patient functions the mandible.

The extra-articular patient will complain of decreased range of motion of the mandible. Often, this is worse in the morning upon awaking, particularly if the patient clenches and/or grinds (bruxism) their teeth while sleeping. Many times the patient will describe a sensation of their jaw feeling locked. This sensation usually goes away as they go about their daily activities.

These patients will also complain that their jaw feels tired and/or tight after functional motions associated with eating, chewing, or prolonged talking.

Often, joint noises such as clicking with function are described. Patients describe a feeling in their

ipsilateral ear of a stuffiness as when going up in an airplane.

All of these symptoms in the extra-articular patient are intermittent daily, weekly, or monthly.

Physical examination is remarkable for tenderness to palpation over the muscles of mastication, particularly the deep masseter, anterior temporalis and its tendon and the cervical and occipital muscles to which the pain migrates.

There is usually no intrameatal tenderness to palpation, and there may or may not be evidence of joint noise on palpation or auscultation of the affected joint(s).

The patients will have a decreased range of mandibular function as demonstrated by measuring the opening pattern between the maxillary and mandibular incisor teeth on maximum opening. The patients will describe a tight sensation as they attempt this maneuver. Lateral excursion are decreased to the contralateral side, and protrusive excursion deviates the mandible to the affected side in unilateral cases.

B. Appropriate Diagnostic Tests and Examinations Suggested Sequence

1. Clinical Diagnosis is supported by these studies:

a. Imaging - plain or panoramic radiograph to determine that there is no gross articular bony pathology.

b. Differential diagnostic local analgesia blocks to determine extra- vs. intra-articular etiology of pain.

c. Trial dosage of medication such as NSAID or muscle relaxant.

C. Inappropriate Diagnostic Tests and Examinations

1. Masticatory or cervical muscle evoked potentials.

2. Trial doses of narcotic analgesics.

D. Supporting Evidence

Imaging is essential to the initial work-up of these patients to rule out the presence of incipient intra-articular biomechanical dysfunction pathology. Differential diagnostic blocks are helpful in complex cases in determining the primary site of the etiology of the problem as extra-articular or intra-articular so the treatment can be appropriately directed. Trial dosages of NSAIDS and/or muscle relaxants can be useful in determining etiology and thus dictate treatment.

III. Treatment

All treatment directly associated with masticatory and cervical muscle pain and dysfunction is done on an outpatient basis. There are occasions when the patient has such a tremendous psychological overlay that inpatient behavioral modification therapy is needed.

A. Appropriate Forms of Therapy

1. Medications

a. NSAIDS
b. Muscle relaxants
c. Sedatives
d. Antidepressants
e. Local analgesic trigger point injections

2. Orthotics

3. Physical therapy

a. Exercises
b. Ultrasound
c. Galvanic stimulation
d. Heat and cold packs
e. TENS
f. Iontophoresis

4. Diet modification

5. Psychological counselling

6. Relaxation therapy

7. Family therapy

B. Supporting Evidence

With the proper early diagnosis of masticatory and cervical muscle pain and dysfunction with identification of the etiology and its removal or treatment, the vast majority of these patients can be taught to manage this problem. Progression of this problem untreated can lead to biomechanical dysfunction in a small percentage of cases (5%).

C. Estimated Duration of Care

Extra-articular TMD is a management problem because there is no anatomical or pathological entity that can be repaired or removed. The basis of the problem is stress relieving patterns that lead to abnormal parafunctional oral habits that result in fatigue, spasm, and muscle pain.

D. Modifiers

Modifying factors are defined as factors that precipitate, aggravate, or alleviate the individual episodes of pain and dysfunction. Frequent precipitating factors include stressful situations, weather changes, and trauma. Frequent aggravating factors include tooth clenching and grinding and tension. Frequent alleviating

factors include heat or ice, rest, medications, massage, stretching exercises and relaxation.

IV. DIAGNOSTIC CRITERIA - Intra-articular Biomechanical Dysfunction

Biomechanical dysfunction of the TMJ can occur as the result of the following pathologic conditions:

1. Trauma

A. Pertinent Historical and Physical Findings

1. History of trauma
2. Physical evidence of fracture
3. Malocclusion
4. Mandibular dysfunction
5. Abnormal relationship of the jaw
6. Presence of a foreign body
7. Hemorrhage in external auditory canal
8. Laceration of external auditory canal
9. CSF in external auditory canal

B. Appropriate Diagnostic Tests and Examinations Suggested Sequence

1. Clinical Diagnosis is supported by these studies:

a. Imaging - Plain or panoramic radiograph to determine the nature and extent of the fracture and any displacement.

- CT Scan
- Tomogram

C. Inappropriate Diagnostic Tests and Examinations

a. Arthrogram
b. MRI
c. Arthroscopy

D. TREATMENT

Outpatient or Inpatient

1. Closed reduction in cases of:

a. Nondisplaced fracture of the mandibular condyle

b. Displaced fracture of the mandibular condyle

c. Medical contraindication for open reduction

2. Open reduction in cases of:

a. Fracture dislocation of the mandibular condyle

b. Mechanical interference with function by a condyle

c. Condyle fracture with loss of anterior – posterior and vertical dimension which cannot be managed by closed reduction

d. Compound fracture

e. Displacement of a mandibular condyle into the middle cranial fossa

E. Supportive Evidence

It has been well documented that with proper treatment, fractures of the mandibular condyle heal well.

F. Estimated Duration of Care

Early mobilization (2 - 3 weeks) is important to prevent ankylosis.

H. Estimated Return to Work

6 - 8 weeks

2. Internal Derangement

A. Pertinent Historical and Physical Findings

1. Earaches, headaches, masticatory or cervical myalgias
2. Clicking or popping of the joint
3. Locking of the joint
4. Restricted masticatory function
5. Restricted range of jaw motion
6. Imaging evidence of disc displacement and/or perforation
7. Arthroscopic evidence of internal derangement

B. Appropriate Diagnostic Tests and Examinations

Suggested Sequence

1. Clinical Diagnosis is supported by these studies:

a. Imaging - MRI
Arthrogram
b. Arthroscopy

C. Inappropriate Diagnostic Tests and Examinations

a. Imaging - any imaging that professes to show disc displacement by condylar position
- CT scan

D. Treatment

Outpatient or Inpatient

1. Arthrocentesis and/or manipulation of mandible
2. Arthroscopic surgery
3. Arthroplasty
a. Discoplasty with or without arthroplasty or discorrhaphy
b. Discectomy

c. Discectomy with insertion of autogenous graft

d. Discectomy with recontouring of the articular surface and placement of autogenous graft

e. Repair of perforated posterior attachment

4. Mandibular condylotomy
5. Orthognathic surgery
6. Orthotics
7. Physical therapy

E. Supporting Evidence

It has been well documented that with proper treatment, internal derangements of the TMJ do well.

F. Estimated Duration of Care

With surgery and post-operative physical therapy, 4 - 6 months.

G. Estimated Return to Work

6 - 8 weeks

PROTOCOL HISTORY:
Passed: 5/24/94
Effective: 6/13/94

ACUTE HAND INJURY PROTOCOLS

I. FRACTURES OF THE HAND AND DIGITS

A. Background

Digital and hand fractures are common in workers who use their hands due to the exposed nature of the upper extremity in most functions at work. Most fractures are due to local trauma caused by an applied force. The energy of applied force determines the severity of the local fractures. Digital fractures are much more common than hand fractures alone.

B. Diagnostic Criteria

Patients present complaining of pain and discomfort in the injured digit, thumb or hand. It is important to obtain a detailed history of the patients' age, occupation, and pursuits, hand dominance and previous hand impairments or injuries. The date of injury should be documented, and the time between injury and care should be determined. The place of injury should be detailed, and the conditions in this environment should be questioned to determine whether the wound or injury is clean or dirty. The exact mechanism of the injury should be evaluated. A past medical history and review of systems should be obtained as part of the complete evaluation.

Each examination should determine if there is abnormal swelling or tenderness over a particular area of a digit. Range of motion of the digit should be evaluated. The vascular state of the digit is checked by observation for signs of ischemia, congestion, or cyanosis. A neurologic examination should be carried out using two-point discrimination. The soft tissue envelope surrounding each fracture should be checked to make sure whether the fracture is open or closed.

C. Appropriate Diagnostic Tests and Examinations

1. Appropriate x-rays must be ordered including true laterals of the digital or metacarpal fractures.

2. On infrequent occasion, noninvasive vascular studies may be deemed appropriate when there is a suspicion of circulatory compromise.

D. Outpatient Treatment

1. Treatment would be splinting, and should heal in four or six weeks provided conservative measures have been instituted.

a. Indications:

1. Pain
2. Limited Motion

b. Treatment Options:

1. Closed reduction as required with/without anesthesia

a. Digital finger splints
b. Intrinsic plus splints
c. Buddy taping
d. Intrinsic plus casting

c. Rehabilitation:

1. After initial healing, active and passive range of motion exercises of the digits, thumb, hand and wrist
2. Strengthening exercises of grip
3. Activity of daily living modification and limitation of job tasks

d. Duration of Care:

6 - 10 weeks

e. Return to Work Status:

1. No use of injured hand, 2 - 3 weeks in most cases
2. Use of injured hand, 6 - 8 weeks

2. Closed reduction, internal fixation / open reduction internal fixation / surgery.

a. Indications:

1. Failure to respond to conservative management
2. Failure to correct digital deformity of displacement
3. Intra-articular joint fracture which cannot be treated closed
4. Open fractures requiring irrigation and debridement

b. Treatment Options:

1. Closed reduction internal fixation
2. Open reduction internal fixation

c. Rehabilitation:

1. After initial healing, active and passive range of motion exercises of the digits, thumb, hand and wrist
2. Strengthening exercises of grip
3. Activity of daily living modification and limitation of job tasks
4. Range of motion exercises after the fracture has healed
5. Wrist splint

d. Duration of Care:

For operative treatment, 3 - 4 months following surgery

e. Return to Work Status:

1. No use of injured hand, 3 - 5 weeks
2. For use of injured hand, 6 - 10 weeks

II. DISLOCATIONS OF THE DIGITS AND HANDS

A. Background:

Dislocations may occur during work. These dislocations require severe tearing of some of the structures surrounding the joints of the digits and the joints of the hand and wrist. An appropriate assessment is very important, as in all of these injuries the joints that are dislocated must be reduced in order to allow adequate post injury function. After repair of these injuries, a period of immobilization that is kept too long may lead to unusual stiffness in the digits. At the time of the initial injury, patients may sustain injury to the cartilage of the joint resulting in traumatic arthritis occurring at a later stage.

B. Diagnostic Criteria:

Most patients complain of a traumatic event requiring a hyperextension force at the level of the digits or in the case of metacarpal dislocations, a direct blow to the knuckles of the hand. The patients present with severe swelling and pain and a deformed digit or hand.

Physical findings include swelling, pain, and limited digital motion. Most deformities are visible on initial examination.

C. Appropriate Diagnostic Tests and Examinations:

1. True lateral radiographs of the digits including AP, lateral, and oblique.
2. True lateral radiographs of the hand including metacarpals which include AP, lateral, and oblique x-rays.

D. Outpatient Treatment:

1. Nonoperative Treatment

Treatment time limited from 6 - 10 weeks

a.Treatment Options:

1. Closed reduction of digital joints under local anesthesia.
2. Immobilization after reduction using digital splints, intrinsic-plus splints of the hand and wrist and/or cast.

b. Rehabilitation:

1. Active and passive range of motion exercises instituted two to six weeks after injury
2. Grip strength exercises
3. Modification of activities of daily living and/or job tasks

c. Return to Work Status:

1. No use of injured hand, 1 - 2 weeks
2. Use of injured hand, 2 - 3 weeks

2. Surgery

a. Indications:

1. Inability to reduce a dislocation under closed conservative treatment
2. Open dislocations of the digits
3. Joint dislocations that are irreducible with injuries to the extensor or flexor tendons

b. Treatment Options:

1. Closed reduction, internal fixation reduction
2. Open reduction
3. Open reduction internal fixation with ligament or tendon repair

c. Rehabilitation:

Rehabilitation in this group takes longer but consists of the same rehabilitation options listed above.

d. Estimated Duration of Care:

1. Operative treatment: 10 - 12 weeks after surgery

e. Return to Work Status:

1. No use of injured hand, 3 - 4 weeks
2. Use of injured hand, 8 - 10 weeks

III. FRACTURES AND DISLOCATIONS OF THE WRIST

A. Background

Fractures and dislocations of the wrist are among the most frequently missed diagnoses of emergent musculoskeletal problems. Complex dislocations of the wrist have been reported to be missed in some emergency room series, as many as 60% of patients presenting with these injuries. Careful evaluation by physical examination, history and radiographic analysis will generally recognize all carpal injuries.

B. Diagnostic Criteria:

1. Pertinent History and Physical Findings:

Patients with fractures and dislocations of the wrist sustain injury by having a direct blow to the wrist or falling, sustaining a hyperextension or injury to the hand and wrist. The intricate anatomy of the carpal bones and the multiple overlapping shadows on a radiograph make these injuries more difficult to diagnose. Most injuries are missed at the initial examination. A treating physician must be aware of tenderness over the anatomical snuff box of the wrist and scaphoid fractures and significant swelling and restriction of motion which occurs in serious ligament disruptions. Wrist sprain diagnosis should not be made until a fractured scaphoid and serious ligament injury is ruled out.

The patients present with tenderness and swelling at different localized portions of the wrist. The swelling and discomfort is localized to the area where the injury has occurred. Most patients have difficulty with gripping and with bending the wrist in extension and flexion. Patients may occasionally have symptoms of numbness and tingling in the median or ulnar nerve distribution depending on the level of injury and the site of injury.

Physical examination will find resisted wrist extension or flexion, swelling in different parts of the wrist and point tenderness over the anatomical area injured.

2. Appropriate Diagnostic Tests and Examination

a. Radiographs of the wrist
b. Tomograms and CT scans of the wrist for suspected nonunion
c. Arthrograms and fluoroscopic examinations of the wrist when physical examination shows evidence of wrist instability

3. Treatment

a. Outpatient treatment/nonoperative treatment
Treatment time is based on the specific injury. Some fractures, such as triquetral fractures, may heal in four to six weeks. Scaphoid injuries may take from three to six months to heal treated conservatively. The treatment options may take from three to six months to heal treated conservatively.

1. Treatment Options

a. Neutral position wrist splint
b. Thumb spica short arm cast, thumb spica long arm cast

2. Rehabilitation:

a. Digit hand and wrist exercises, including active and passive range of motion and grip strengthening

b. Modification of activities of daily living and/or job tasks when told the injury is completely healed.

b. Surgery

1. Indications

Failure to heal with nonoperative management

2. Treatment Options

a. Open reduction, internal fixation of fracture

b. Open reduction and operative repair of ligament injuries

c. Intercarpal fusions

d. Radiocarpal fusions

e. Wrist arthroscopy

c. Rehabilitation

1. Digital hand, wrist active and passive range of motion exercises.

2. Grip strengthening exercises, wrist splinting in position of extension

d. Estimated Duration of Care

1. Nonoperative treatment
In most cases, 6 weeks to 6 months

2. Operative treatment
3 to 6 months following surgery

e. Return to Work Status:

1. No use of injured hand, 3 - 4 weeks
2. Use of injured hand, non-operative, 6 - 12 weeks
3. Use of injured hand, operative, 8 - 14 weeks

IV. TENDON INJURIES

A. Background

The flexor and extensor tendons of the digits lie superficial underneath the skin and, therefore, are commonly injured structures. They are a significant problem for patients, physicians, rehabilitation specialists and hand specialists. The primary care of each patient with tendon injuries will determine their final outcome. Diagnosis is difficult despite careful examination due to the complexity of the extensor and flexor tendon systems in the upper extremity. Every lacerated hand is suspect to this type of injury. Even a small wound in a finger can be associated with a complete laceration of two tendons. Topographical anticipation is very important in evaluating these injuries.

B. Pertinent Historical and Physical Findings

A complete rupture of an extensor flexor tendon may occur without a wound of any kind. Spontaneous ruptures can occur in patients with medical conditions while at work. Most open tendon injuries are secondary to sharp objects which cause wounds to skin and soft tissues. The position of the hand at the time of injury is important to determine where the tendon may be injured. Most patients present stating they cannot fully bend or extend their finger or hand and have altered function. Most present with pain and sometimes present with numbness in the digit.

Physical examination of all tendon injuries includes subtle evaluation of the normal stance of the digits in both flexion and extension. Active motion tests when

performed will show a lack of motion in affected digits. Partial lacerations can be noted in patients who have pain.

C. Appropriate Diagnostic Tests and Examination

1. Radiographs of digit
2. Sensibility tests of digits after injury

D. Treatment

Outpatient treatment
Nonoperative treatment. In closed extensor tendon injuries, patients can be treated with conservative measures.

1. Treatment Options

a. Neutral position intrinsic plus splints
b. Digital splints
c. Buddy taping

2. Rehabilitation

a. Active and passive range of motion of digits, hand and wrist
b. Grip strengthening exercises

E. Surgery

1. Indications

a. All open tendon injuries with open wounds with limited motion, pain with motion or expectant tendon injury
b. Closed flexor tendon injuries
c. Failure to respond to nonoperative treatment and rehabilitation after appropriate time to heal, active and passive range of motion exercises of the digits and hand

2. Estimated Duration of Care

Nonoperative treatment
8 to 12 weeks after injury
Operative treatment
3 to 6 months after injury

3. Return to Work Status:

a. Non-operative treatment, 6 weeks
b. Operative treatment, no use of injured hand, 3 - 4 weeks
c. Operative treatment, use of injured hand, 8 - 10 weeks

V. DIGITAL NERVE INJURIES

(with addendum regarding peripheral nerve injuries in general)

A. Background

Most of the significant injuries to the digital nerves result in loss of sensibility distal to the level of injury and are usually the result of lacerations frequently involving the flexor tendons. Significant contusions or crush may disrupt the ability of the nerve to function without physically dividing it.

B. Diagnostic Criteria

1. Pertinent History and Physical Examination

a. History of trauma
Usually with a laceration over the volar surface of the digit (palm for common digital nerves)
b. Absent sensibility (feeling)
In the distribution of the nerve in question

2. Appropriate Diagnostic Tests

a. Gross Touch - diagnostic if deficit is in appropriate anatomic distribution with laceration overlying the expected course of the nerve

b. Quantitative

1.two-point discrimination (moving and static)

2. monofilament testing

3. vibration

C. Treatment

1. With laceration and probable division of the nerve - operative exploration and repair with magnification. Repair end-to-end if healthy nerve, divided ends can be approximated without significant tension. Otherwise repair with interposition nerve graft.

a. Immediate

If the patient is a suitable operative candidate

b. Urgent

Skin wound may be closed and repair delayed for up to 7 days and subsequently repaired primarily.

c. Delayed

Over 7 days, if the patient is unstable or graft is known to be needed. After 7 days, neuroma at the divided nerve ends will need to be resected and more nerve length required for closure without tension than if repaired sooner.

2. With laceration - and diagnosis of nerve division is equivocal

a. Explore

1. If the patient is at surgery for other injuries

2. If the wound does not need to be enlarged

b. Observe
With closure of the wound and reassessment in 1 - 3 days

3. Without laceration

a. Observe for progression of return of function (Tinel's sign)
b. Explore if progression of Tinel's sign is not seen

D. Rehabilitation

1. Splint for 3 weeks to maintain minimal tension on the nerve repair with elevation to minimize swelling

2. Range of motion begun on the splinted joints after 3 weeks avoiding stretching of or trauma to the nerve repair for an additional 3 weeks

3. Estimated Duration of Care

a. Return to work not requiring stretch of or trauma to the nerve repair area or sensibility in the nerve distribution during the third through the fifth week after repair
Return to work with injured hand, excluding use of the injured digit, at 5 weeks.
b. Return to work requiring sensibility in the nerve distribution
1. Gross sensibility - 1 mm. per day or 1 in. per month. Nerve regeneration beyond the level of injury as indicated by advancing Tinel's sign and return of sensibility
2. Maximum return of sensibility as approximately twice the time required for gross sensibility (return of nerve function after significant injury is never 100%, but may range from none to the case where function is less than 100% but abnormality may not be detectable.)
c. Maximum medical improvement - 3 to 6 months depending upon IV.C.2.b above and wound scar maturation.

If function is unsatisfactory after IV.C.2.b, resection of neuroma and nerve grafting may be indicated.

N.B. Peripheral Nerve Injuries

The preceding generally applies for all peripheral nerve injuries. The more proximal the injury the longer to return to function and the less likely that the functional return will be complete.

Mixed and motor nerve injuries have self-evident other diagnostic criteria and functional impairment implications related to the loss of respective motor function. If motor return does not occur or is unlikely, then tendon transfers may be indicated.

VI. FINGER TIP INJURIES

A. Background

Finger tip injuries are among the most common work-related injuries in the manufacturing and construction sectors.

B. Diagnostic Criteria

1. Definition

For the purpose of this protocol, finger tip injuries include those in which there is some full-thickness soft tissue loss and/or compound fracture of the distal phalanx of an upper extremity digit and/or nail bed injury requiring repair. Significant injuries which continue proximal to the DIP joints are considered separately as more severe.

2. Diagnosis

Physical (and x-ray) examination

C. Treatment

1. Out-patient emergency room facility

Debridement and repair of lacerations
Reduction of fractures
Skin grafts (full or partial thickness)
Local flaps
Amputations

2. Out-patient operating room (occasionally requiring overnight hospitalization)

Fixation of complex or intra-articular fractures
Pedical flaps

3. In-patient operating room

Sensory neurovascular island flap (rare)

D. Rehabilitation
1. Elevation and protection of fractures
2. Gradual mobilization and desensitization
3. Estimated duration of care -
a. 3 - 6 weeks to return to light non-forceful, non-dextrous or non-discriminating use of the injured digits
b. 6 - 12 weeks to return to forceful use of injured digits (grafts and flaps will not have normal sensibility resulting in some permanent impairment)
4. Return to work status -
No use of injured hand - 2 - 3 weeks
5. Maximum Medical Improvement in 3 - 4 months
(older patients take longer to recover mobility)

VII. ULNAR COLLATERAL LIGAMENT INJURY OF THE THUMB (SPRAIN/TEAR)

A. Background

Injuries to the ulnar collateral ligament of the thumb are sustained in a variety of ways. These include a fall from a height that results in a radial deviation force

being applied to the metacarpophalangeal joint such that the ligament is placed under tension. The ligament may tear partially or completely, or be avulsed from its bony attachment with or without an associated fracture. The injury is commonly seen as a result of falls during skiing and during contact sports. Pain, swelling, and weakness are frequent presenting complaints.

B. Diagnostic Criteria

1. Pertinent History and Physical Findings

There is a history of a blow or a fall involving the thumb. There is pain with motion of the thumb and swelling about the ulnar collateral ligament of the thumb. Palpation along the ulnar aspect of the metacarpal phalanageal joint may reveal a lump where the avulsed ligament is rolled up on itself. Instability may be present on ulnar stress.

2. Appropriate Diagnostic Tests and Examinations

a. X-rays of the injured thumb followed by (b)
b. Stress examination with or without x-ray documentation
c. Comparative examination of the opposite thumb

3. Inappropriate Diagnostic Tests and Examinations

a. Arthroscopy of MP joint
b. CT scan
c. MRI
d. Radionuclide scan

4. Exceptions to Criteria
None

5. Evolving Diagnostic Tests and Examinations

a. Arthrography, as indicated
b. CT scan
c. MRI
d. Radionuclide scan

C. Treatment

1. Outpatient Treatment

a. Nonoperative treatment
1. Indications
a. When there has been an incomplete injury to the ligament such that it is not completely

disrupted either within its substance or from its attachments

b. When there is a nondisplaced fracture at the attachment of the ulnar collateral ligament

2. Treatment options
a. Immobilization for approximately 4 - 6 weeks
b. Elevation and range of motion of all uninvolved joints

3. Home Health Care
None

4. Rehabilitation
Active ROM after cast or splint removal

b. Ambulatory Surgery

1. Indications
a. Any displaced or avulsed fracture with ligament attachment
b. Complete ligament disruption
c. Stenner's lesion (displacement of the ulnar collateral ligament superficial to the adductor tendon)

2. Treatment Options
a. Exploration and ligament reapproximation or fracture reduction and/or fixation with attached ligament followed by immobilization for approximately 6 – 8 weeks
b. Primary or secondary reconstruction

c. Postoperative elevation and range of motion of all uninvolved joints

3. Home Health Care
   None
4. Rehabilitation
   Active ROM after cast or splint removal

c. Non-operative treatment
   1. No use of injured hand, 3 weeks
   2. Use of injured hand, 8 - 10 weeks

d. Operative treatment
   1. No use of injured hand, 4 weeks
   2. Use of injured hand, 10 - 12 weeks

VIII. DIGITAL STENOSING TENOSYNOVITIS (TRIGGER FINGER)

A. Background

Caused by irritation and inflammation of the flexor tenosynovium at the A-1 pulley of the digital flexor tendon sheath. This can be due to trauma in a single event or repetitive "micro-trauma", or inflammatory process. This is often seen with other manifestations of tendinitis or tenosynovitis such as carpal tunnel syndrome and DeQuervain's tendinitis.

B. Diagnostic Criteria

1. Pertinent History of Physical Findings

Most commonly repetitive grip, forceful hand tool use or use of vibratory tools will lead to gradual onset of pain and limitation of full flexion with clicking or "triggering" of the digits. Alternatively there may be a single episode of pain with forceful grip or hyperextension of the involved digit.

Physical exam will demonstrate specific pain over the flexor sheath of the digit with most tenderness over the A-1 pulley (distal palmar crease), crepitance in this area with active motion, passive motion arc greater than active motion arc and then audible and palpable click as

the digit triggers when placed through a range of flexion and extension.

Associated swelling of the fingers (such that rings do not fit), worse stiffness in the morning and less during the day are also common.

2. Appropriate Diagnostic Tests and Exams

a. X-ray of the hand to rule out associated arthritis or bony lesions.
b. Clinically suspicious for connective tissue disease, studies to rule out systemic disease could be considered

3. Inappropriate Tests

a. MRI
b. Ultrasound
c. CT Scan

4. Exceptions to Above Criteria

Investigations with MRI and/or ultrasound if suspicious lesion other than classic stenosing tenosynovitis is considered; i.e., suspicion of tumor.

C. Treatment

1. Non-operative Treatment

a. Indications: pain, triggering, functional disability
b. Treatment Options:
1. Non-steroidal anti-inflammatory medications
2. Intermittent splinting
3. Tendon sheath steroid injection (up to three times)
4. Activity alterations

2. Operative Treatment: Out-patient Surgery

a. Indications
No response to non-operative treatment over a 4 - 10 week period depending on symptom complex

b. Treatment Options
1. Operative release of the A-1 pulley, partial excision and partial release of a 2 pulley proximal margin under local, regional, or general anesthesia

2. Limited tenosynovectomy of flexor tendons

c. Rehabilitation
1. Progressive active range of motion and strengthening
2. P.T. may be needed for scar tenderness or post surgical stiffness
3. Occasionally with long term trigger fingers a period of postoperative splinting to regain full extension may be needed

3. Estimated Duration of Care
1. Nonoperative treatment, 4 - 10 weeks depending on symptom complex
2. Operative treatment, 3 - 6 weeks recovery from surgery with occasional post operative splinting

4. Anticipated Outcome
1. Complete resolution of the symptoms
2. Full unrestricted use of the hand

5. Return to Work Status
1. Non-operative, 2 - 5 weeks
2. Operative
a. No use of injured finger, 2 weeks
b. Use of injured finger, 4 - 6 weeks

PROTOCOL HISTORY:

Passed: 5/24/94
Effective: 6/13/94

PHARMACEUTICAL PROTOCOLS

The Medical Advisory Board establishes this protocol with the intent to:

1. Reduce the numbers of GI bleeds and other complications caused by prescriptions;
2. Reduce the numbers of injured workers being addicted to pain medications;
3. Reduce the disposal of drugs that are ineffective or not tolerated by the worker.

The protocol is established as follows:

1. Generics should be used as the first choice;
2. If a generic equivalent exists, but the attending physician feels that the brand name is needed, the physician must seek preauthorization from the insurer before using that drug;
3. No over-the-counter medications will be paid for unless prescribed by the attending physician;
4. Workers not declared permanently injured may not receive more than a thirty (30) day prescription at any one time. No more than one (1) refill will be allowed without a new prescription form;
5. At the end of three months time, if additional medication is needed, the attending physician must make a clear statement to the insurer substantiating the need for additional medication being prescribed;
6. Any new prescription (a drug not previously shown effective and/or tolerated by an injured worker) must include a 10 day trial period on the initial prescription;
7. Permanently injured workers requiring ongoing medication should use mail away pharmacy designated by their workers' compensation insurance company for a ninety (90) day prescription, if this service is more cost effective.

PROTOCOL HISTORY
Passed: 1/9/2001
Effective:1/30/2001
In replacement of previous pharmaceutical protocols
Passed 3/21/95 - Effective 4/10/95

CONTACT DERMATITIS PROTOCOL

Contact dermatitis is a broad term used to describe various abnormal reactions of the skin to the external environment. Contact dermatitis is of two types - allergic and irritant. Allergic contact dermatitis represents an immunologic response of the skin to an external allergen. Irritant refers to a reaction to a chemical substance seen in certain susceptible individuals at lower concentration than would be expected in "normal" people. Either condition can be induced by or aggravated by photic exposure.

I. DIAGNOSIS: Appropriate evaluation and diagnostic measures include the following:

   a. Extensive and comprehensive history and complete examination of the skin is necessary to diagnose the nature and cause of the patient's condition.
   b. Skin biopsy may be necessary if the diagnosis is unclear or if there is a question of an underlying (coincident) skin disease.
   c. Bacterial and fungal cultures and limited blood evaluation may also be required.
   d. Patch testing is frequently necessary to identify the offending agent.
   e. On rare occasion, intradermal scratch tests to the suspected allergens may be necessary, particularly in dealing with an urticarial form of dermatitis.

II. THERAPY:

   a. Removal of the patient from contact with the suspected allergen is necessary. The acute process generally persists for a period of two to four weeks.
   b. Local therapy to include wet dressings, steroids, and/or emollient creams, tars, etc., are usually required.
   c. Systemic therapy may be required as well (antibiotics, antifungals, steroids, etc.). A

chronic disorder may require use of tar, tar baths, or local PUVA.

d. If the process persists, referral for dermatologic specialist care should be made after one month of therapeutic treatment.

III. PROGNOSIS:

a. Assuming that the patient is removed from the offending agent, the acute contact reaction usually resolves with appropriate treatment over a two to four week period, depending upon the severity and location of the condition. A chronic dermatitis may require treatment over a three to six month interval, particularly if an underlying skin disease is contributing to the problem. On rare occasion, the condition is persistent and non-responsive to the usual treatments.

IV. DISPENSATION:

a. With contact allergen - If the patient is found to be allergic to a specific material (at work) he-she cannot return to work requiring further contact with a specific agent. However, the previous difficulty does not preclude work in a similar field where the specific allergen is not present.

b. With contact irritant - The patient may be able to return to his-her present job with exposure to a more dilute concentration of the offending substance or with a more protected situation (gloves, creams, hardening, etc.).

PROTOCOL HISTORY:

Passed: 3/21/95
Effective: 4/10/95

PROTOCOL CONCERNS REGARDING PERFORMANCE OF RADIOGRAPHIC EVALUATION IN WORKERS' COMPENSATION CASES

1. Repetition of X-rays:

A repeat examination for fracture would be considered reasonable in 7-10 days of initial radiographic examination, assuming that initial films fail to demonstrate fracture and that symptoms persisted, which suggested the possibility of occult fracture.

Alternatively, bone scan evaluation, magnetic resonance imaging, or CT imaging of the symptomatic bone could be done, which would preclude the necessity of repeating x-ray examination.

Repeat examination of a known fracture might be considered in order to assess fracture healing, angulation, or displacement which might have occurred since the initial fracture.

Repetition of radiographic examinations would not be considered within reason if done for convenience (either patient or physician convenience) or because of failure to obtain adequate history revealing that radiographs had been obtained.

2. Comparison X-Rays:

Comparison x-rays would be considered reasonable if there is, on initial radiographic examination of the affected area, a finding which may or may not represent a variation of normal.

The observed finding for which comparison views are deemed necessary must be well described in the initial report and given as a reason for obtaining comparison x-rays.

3. Contiguous Parts:

Radiographic examination for workers' compensation injury should be preceded by examination of physician, chiropractor or nurse practitioner and the examination specified by that examiner, and that examination should be limited to only those areas which are symptomatic or felt to be significant in the evaluation of patient injury.

For example: If injury has occurred to the metacarpal region of the hand, only a right hand radiographic evaluation would be considered as necessary, and right hand radiographs would be requested by the medical personnel. Interpretation and billing of right hand and right wrist radiographs, in this instance, would be considered unnecessary, as the site of suspected injury is the hand and not the wrist, and considering that the wrist is usually included in hand radiographs.

An additional example would consist of injury to the right thigh. X-rays requested for evaluation of the right femur should include both the knee and hip, but billing for right hip, right femur and right knee would be considered improper, as only the right femur x-ray examination was requested. Continuing this example, if there was concern of right femur fracture and abnormality of the right hip, then both right femur and right hip radiographs should be obtained, and these examinations would be considered medically necessary.

4. Regarding Health Care Professionals or Extenders Examination of Patient Prior to X-ray:

It is felt that a physical examination and a history would be necessary before a proper radiographic evaluation could be requested and performed.

With regard to protocols for specific injuries:

a. Low back musculoligamentous injury - Appropriate diagnostic tests -

If the acute injury involves trauma, radiographic examination following the traumatic event would be considered appropriate.

If the injury is not precipitated by a single traumatic event but of chronic origin, x-ray examination should be considered if pain persists for more than four weeks. If pain persists for a period of greater than four weeks, with negative plain radiograph examination, magnetic resonance imaging should be considered for further evaluation, as this imaging modality will evaluate both disc and bone.

Alternatively, CT examination will provide evaluation of disc and, to some degree, bone with nuclear medicine bone scan imaging being limited to the evaluation of metabolically active bone lesions.

b. Neck, muscular injury -
If the injury is not precipitated by a single traumatic event but of chronic origin, x-ray examination should be considered if pain persists for more than four weeks. If pain persists for a period of greater than four weeks, with negative plain radiograph examination, magnetic resonance imaging should be considered for further evaluation, as this imaging modality will evaluate both disc and bone.

Alternatively, CT examination will provide evaluation of disc and, to some degree, bone with nuclear medicine bone scan imaging being limited to the evaluation of metabolically active bone lesions.

c. Acute hand injuries -
Radiographic evaluation immediately following hand injury. Follow-up radiographic evaluation in 7-10 days, if pain persists, suggesting fracture with initial plain radiographs failing to demonstrate fracture.

With penetrating injuries that might result in tendon or ligament damage, magnetic resonance imaging might be helpful in the assessment of fracture extent.

d. Injuries to the foot -
Radiographic evaluation immediately following andfoot injury. Follow-up radiographic evaluation in 7-10 days, if pain persists, suggesting fracture with initial plain radiographs failing to demonstrate fracture.

With penetrating injuries that might result in tendon or ligament damage, magnetic resonance imaging might be helpful in the assessment of fracture extent.

e. Herniated lumbar disk -
See State of Rhode Island Workers' Compensation Court Medical Advisory Board Protocols for Herniated Lumbar Disk.

f. Herniated cervical disk -
See State of Rhode Island Workers' Compensation Court Medical Advisory Board Protocols for Herniated Cervical Disk.

g. Acute injuries to the shoulder -
See State of Rhode Island Workers' Compensation Court Medical Advisory Board Protocols for Acute Injuries to the Shoulder.

h. Acute injuries to the knee -
See State of Rhode Island Workers' Compensation Court Medical Advisory Board Protocols for Acute Injuries to the Knee.

PROTOCOL HISTORY
Passed: 6/18/96
Effective: 7/08/96

CUBITAL TUNNEL SYNDROME

I. BACKGROUND

Cubital tunnel syndrome consists of compression of the ulnar nerve at the medial side of the elbow either proximal to, within, or distal to Osborne's ligament. The ulnar nerve runs along the medial (inner) aspect of the elbow and courses behind the medial epicondyle (the prominent bone on the inside of the elbow) travelling distally to innervate the musculature of the hand. The condition may have multiple causes, including:

A. Chronic compression,
B. Local edema or inflammation,
C. Space-occupying lesions such as tumors,
D. Overuse of the elbow in a repetitive flexion and extension fashion,
E. Habitual sleeping in the "fetal position" with prolonged flexion of the elbow in this position.
F. In association with weight loss or other metabolic disorder.

The condition can occur at any age but is generally seen between 25 and 45 years of age. It occurs slightly more frequently in women than in men.

II. DIAGNOSTIC CRITERIA

A. Pertinent Historical and Physical Findings.

Patients most frequently complain of paresthesias, numbness and tingling in the ulnar nerve distribution of the hand (the ulnar half of the right finger and the small finger). This is frequently noted in the morning after sleeping all night with the nerve bent (this is most frequently seen in patients who sleep with their arm bent either tucked under the pillow or next to their head).

Symptoms are also frequently noted after extensive elbow flexion/extension use and to a lesser degree persistent postural maintenance of the arm in an unusual location. The most characteristic history involves

numbness and tingling in the ring and small finger with occasional burning or pain at the elbow region itself. Patients can have radiation of symptoms to the neck region with pain at that location. Weakness of grip (due to intrinsic muscle loss) is occasionally seen and demonstrates advanced disease.

One must be careful to evaluate other causes of ulnar nerve distribution numbness and tingling such as compression of the ulnar nerve at the wrist (Guyon's canal compression syndrome) and thoracic outlet syndrome (involving compression of the brachial plexus in the shoulder/neck region which most frequently involves the lower roots causing numbness and tingling in the ring and small finger). An elbow flexion test is also frequently seen as positive. Testing of the intrinsic musculature of the hand specifically with resisted abduction of the fingers is important to determine if any intrinsic atrophy has occurred indicating advanced disease. These tests should be considered strongly corroborative, but their absence in and of themselves does not exclude the diagnosis.

B. Appropriate Diagnostic Tests and Examination.

1. Radiographs of the elbow.
2. Electromyographic and nerve conduction studies.
3. Rule out metabolic factors that could give rise to peripheral neuropathy such as diabetes and pernicious anemia and other metabolic disorders, including chronic alcoholism.

C. Supporting Evidence.

Positive electromyographic and nerve conduction studies can be helpful in establishing the diagnosis, although a relatively substantial number of patients can have negative electrodiagnostic studies and still have this condition. Electrodiagnostic tests with an appropriate clinical history and physical examination are most useful in patients who have atypical distribution of symptoms or where secondary gain may be a motive. The most difficult

differentiation generally involves patients who have neck pain or symptoms related to the neck/shoulder region.

III. TREATMENT

A. Outpatient Treatment.

1. Nonoperative treatment - treatment is generally limited to four to eight weeks, provided all appropriate conservative measures have been assessed.

a. Indications.
All patients who do not demonstrate muscle atrophy.

b. Treatment Options.
1) Elbow extension splint worn at night.
2) Nonsteroidal anti-inflammatory medications.
3) Activity modifications to avoid repetitive elbow flexion.

c. Rehabilitation.
1) Extension splinting at night per treatment options protocol.

d. Supporting evidence consists of a transient response to extension splinting of the elbow at night.

2. Ambulatory Surgery.
Referral to an Orthopedic Surgeon, Neurosurgeon, or Hand Surgeon is indicated before proceeding with the surgical treatment.

a. Indications.
1) Failure to respond to conservative nonoperative treatment.
2) Presence of intrinsic muscle atrophy or weakness.
3) Progressive or non-changing symptoms.

b. Treatment Options.

1) Release of the ulnar nerve at the cubital tunnel with anterior transposition of the nerve itself.

2) Release of the ulnar nerve at the cubital tunnel with medial epicondylectomy.

c. Rehabilitation.

1) Range of motion and strengthening exercises to the hand, wrist, and elbow.

2) Night time splinting in the immediate postoperative period.

3) Heat prior to range of motion exercises.

B. Estimated Duration of Care.

1. Nonoperative treatment - maximum medical improvement.

2. Operative treatment - eight to ten weeks following surgery.

PROTOCOL HISTORY
Passed: 6/18/96
Effective: 7/08/96

RADIAL TUNNEL SYNDROME

I. BACKGROUND

Radial Tunnel Syndrome involves compression of the radial nerve in the proximal forearm. In this region, the radial nerve splits into the posterior interosseous nerve branch (the main trunk) and the sensory branch of the radial nerve (the minor trunk) in the proximal forearm. Compression can occur either before or after this split off of the sensory branch of the radial nerve has occurred. The condition has multiple causes including space-occupying lesions such as tumors, local edema or inflammation, overuse of the hand and wrist through repetitive movements, blunt trauma to the proximal forearm with secondary bleeding, and idiopathic onset. The condition can occur at any age but is generally seen in younger individuals.

This is a rare condition, infrequently encountered by most practitioners, and in the case of failure to respond to non-operative treatment, the patient should be referred to a surgeon who has had experience in the treatment of Radial Tunnel Syndrome.

II. DIAGNOSTIC CRITERIA

A. Pertinent Historical and Physical Findings.

Patients generally complain of a deep-seated aching or tightness in the proximal forearm over the mobile wad of Henry muscle mass. Patients can occasionally have sensation of paresthesias and numbness and tingling in the distribution of the sensory branch of the radial nerve (the dorsal first web space of the hand including the back of the thumb and back of index finger).

Patients frequently have symptoms after significant repetitive or power grip use of the upper extremity involved. Burning or pain can also be associated with the condition and should be related to the proximal forearm, specifically over the mobile wad of Henry muscle mass. Strength in the hand is generally not reduced. Patients can have pain with resisted wrist extension or

resisted extension of the middle finger with pain being noted in the proximal forearm during these maneuvers. A Tinel's sign is rarely seen over the nerve itself.

Patients most commonly have a positive radial tunnel compression test which involves the examiner rolling the fingers over the radial nerve region in the proximal forearm eliciting pain and tenderness in the local region. Occasionally, distal radiation of symptoms along the sensory branch of the radial nerve distribution will occur during this test.

B. Appropriate Diagnostic Tests and Examinations.

1. Radiographs of the forearm.
2. Electromyogram and nerve conduction studies.
3. Trial injection of Xylocaine around the radial nerve to see if symptoms resolve.

C. Supporting Evidence.

EMG/nerve conduction tests can be helpful if positive but are most frequently negative in this particular condition. The nerve conduction velocity component is rarely positive, and diagnosis is generally made on the electromyographic component showing changes in the muscle innervated by the posterior interosseous nerve.

III. TREATMENT

A. Outpatient Treatment.

1. Nonoperative treatment - treatment time generally limited to three to six weeks, provided all appropriate conservative measures have been assessed.

a. Indications.
1) Mild to moderate symptoms.
2) Symptoms after significant use activities of the affected upper extremity.
b. Treatment Options.
1) Neutral position wrist splint.

2) Steroid injection.
3) Nonsteroidal anti-inflammatory medications.
4) Activity modification.

c. Rehabilitation.

1) Modification of activities of daily living and/or job tasks.
2) Ultrasound over the mobile wad of Henry.

d. Supportive evidence consisting of favorable response to Xylocaine injection at the radial nerve region.

2. Ambulatory Surgery.

a. Indications.
1) Failure to respond to nonoperative treatment.
2) Loss of wrist or finger extensors or significant weakness in this distribution.
3) Progressive or unchanged symptoms.

b. Treatment Options.
1) Neurolysis of the radial and posterior interosseous nerves under regional or general anesthesia.

c. Rehabilitation.
1) Range of motion and strengthening exercises of the fingers, wrist, and elbow.

B. Estimated Duration of Care.

1. Nonoperative treatment - maximum medical improvement.
2. Operative treatment - six to eight weeks following surgery.

PROTOCOL HISTORY
Passed: 6/18/96
Effective: 7/08/96

DORSAL COLUMN STIMULATORS

I. BACKGROUND:

The Dorsal Column Stimulator (DCS) is a device that allows for electrical stimulation of the dorsal aspect of the spinal cord in an effort to relieve pain. Stimulation in this area interferes with the conduction of pain impulses through adjacent sensory pathways. The technique does not alter the underlying pathological process. However, in selective patients with persistent and intractable pain of nerve origin, approximately 50 percent of patients will have pain relief, thereby decreasing the need for analgesic medication and at times obviating the need for further surgical procedures.

II. PROCEDURE:

One or more epidural electrodes are inserted into the spinal canal over the dorsal aspect of the spinal cord. The locus of the electrode placement - cervical, thoracic, or lumbar - depends on the location of the patient's pain. The electrode is usually placed by a percutaneous technique, but on occasion (usually in a post-surgical patient) surgical placement (laminotomy) is required.

The procedure is done in two stages. In the trial stage the electrode is implanted, and a wire is located outside of the body. A hospital stay of one to two days is usual. The trial usually lasts from three to five days, and if successful in relieving pain, permanent placement of the DCS is undertaken. The procedures are generally safe, but on occasion, local or epidural infection occurs.

III. CONDITIONS FOR WHICH DCS PLACEMENT IS APPROPRIATE:

1. The "failed back syndrome" with persistent, intractable disabling pain of nerve origin (Perineural fibrosis, arachnoiditis, etc.) in spite of maximum medical,

surgical, or other therapies, (approximately 75 percent of cases).

2. Chronic and intractable pain following spinal cord injury (approximately 5 to 10 percent of cases).

3. Nerve disorders including nerve injuries, reflex sympathetic dystrophy, post-amputation or phanton limb pain, post herpetic neuralgia which have failed to respond to the generally acceptable alternative modalties of therapy.

IV. CRITERIA GUIDING PATIENT SELECTION FOR DCS:

1. DCS implantation is restricted to those patients with an objective organic basis for neurogenic pain for whom conventional medical, surgical, or other therapeutic modalities and behavioral therapy have been unsuccessful in providing adequate pain relief. Patient's problem must have been previously evaluated by at least two prior consultants (neurosurgeon, neurologist, physiatrist, or orthopedic surgeon).

2. Patients must have an evaluation by a psychologist or psychiatrist with specific experience in the evaluation of chronic pain problems.

3. A satisfactory response to trial of DCS with the temporary insertion of an epidural electrode is required prior to permanent placement of a DCS.

4. Implantation treatment is limited to those physicians with training and experience in the area of pain management and specifically DCS use.

V. CONTRAINDICATIONS TO USE OF DCS IMPLANTATION:

1. Patients with significant drug-seeking behavior, including substantial drug and alcohol abuse.

2. Patients with substantial psychological instability, psychosis, etc. need to be carefully evaluated or excluded.

3. Patients in whom secondary gain (compensation, litigation, etc.) may play an important role, need careful evaluation and/or exclusion.

4. Patients of advanced age or with terminal illness are generally not considered appropriate for DCS treatment.

5. Patients on chronic anti-coagulation treatment.

PROTOCOL HISTORY

Passed: 6/9/98
Effective: 6/30/98

ANTERIOR CRUCIATE RUPTURES

I. Acute Ruptures of the Anterior Cruciate Ligament

There is a history of direct trauma to the knee of the patient or of an injury involving torsional or angular forces.

The protocol for the management of acute injuries to the knee notes two separate sets of circumstances which require orthopaedic referral and, namely, these are "clinical evidence of gross ligamentous instability" and "the initial presence of a tense hemarthrosis or the development of a recurrent hemarthrosis." These are diagnostic features of acute ruptures of the anterior cruciate ligament.

Diagnostic Tests

1. Plain x-rays to rule out associated fractures.
2. MRI - to confirm the diagnosis and/or to determine associated meniscal or ligamentous pathology.
3. Diagnostic/Therapeutic arthroscopy - to confirm the diagnosis and/or to provide initial or definitive treatment.

A. Outpatient Nonoperative Treatment

1. Aspirate knee.
2. Analgesics.
3. Compression dressing, ice application, immobilizer splint.
4. Nonweight bearing with crutches.
5. Physical therapy - initially a period of range of motion exercises followed by a progressive resistive exercise program.
6. Question long-term bracing.

Duration of this treatment program is six to eight weeks.

Probable outcome - clinical recovery with residual permanent partial impairment of function which may be of mild (3% 7%), moderate (7%, 17%), or severe (10%, 25%).

B. Outpatient Operative Treatment

1. One to four as above with an operative arthroscopy and debridement followed by five and six.

Duration six to eight weeks.

Probable outcome - probable clinical recovery with residual impairment which may be mild (3%, 7%), moderate (7%, 17%) or severe (10%, 25%).

C. Inpatient Operative Treatment

1. Treatment measures as above followed by an open arthrotomy or arthroscopy with reconstruction of the anterior cruciate ligament.
2. Surgical procedure followed by a period of total and then partial immobilization followed by a rehabilitative physical therapy program.
3. Duration of treatment - 12 to 16 weeks from the date of the surgical procedure.

Anticipated outcome - clinical recovery with residual permanent partial impairment which may be mild (3%, 7%), or moderate (7%, 17%) or severe (10%, 25%).

II. Chronic Rupture of the Anterior Cruciate Ligament

Clinical features include a history of a remote injury from which full recovery never occurred for which surgical treatment was either not done or was not successful. History of recurrent effusions and/or demonstrable instability with likelihood of secondary traumatic arthritic changes.

Nonoperative and operative options similar to those outlined for acute ruptures.

PROTOCOL HISTORY

Passed: 6/9/98
Effective: 6/30/98

HEARING LOSS PROTOCOL

I. INTRODUCTION

Hearing loss related to injury sustained in the workplace is of two general types:

1) Acuity hearing loss related to a single event - usually trauma (ex: in association with a basal skull fracture) or by other mechanism.

2) Occupational hearing disorder, generally related to chronic exposure to excessive noise in the workplace, resulting in nerve(s) injury. This condition is usually bilateral and is almost always less than total. Occupational hearing loss is generally a loss in the 4,000-6,000 Hz range; however, it can, at times, affect the lower frequencies.

II. DETERMINATION OF THE EXTENT OF AND THE CAUSE(S) OF HEARING LOSS FOR THE PURPOSE OF COMPENSATION FOR THE INJURY(IES) SUSTAINED

1) The patient will be examined by a Board Certified Otolaryngologist to determine the cause(s) of the hearing loss and the extent of that loss. The physician will determine if hearing loss has occurred as well as the extent of the loss in each ear. The physician will determine the relationship of the hearing loss to the workplace injury and will determine, if possible, the coexistence of other processes that may have antedated the injury(ies) in the workplace.

2) An Audiometric Study will be performed after maximum rehabilitation has been achieved and when the impairment is judged to be stable (neither improvement nor progression). Audiometric Testing for the purpose of determining the degree of hearing impairment will not be performed before 4 to 6 weeks following acoustic injury.

3) Testing will be performed without the use of prosthetic devices (Hearing Aids).

4) Audiometric Testing will be performed by a Certified Audiologist or Board Certified Otolaryngolgist. Decibels of hearing loss will be determined (for each ear) at frequencies (measured in cycles/sec-Hz) of 500, 1,000, 2,000, 3,000, 4,000 and 6,000 Hz.

III. HEARING LOSS AT A LEVEL 3,000 Hz. OR LESS

a) Evaluation of Monaural Hearing Impairment: If the average of the hearing levels at 500, 1,000, 2,000 and 3,000 Hz. is 25 decibels or less, according to ANSI Standards, no impairment is considered to exist in the ability to hear everyday sounds under everyday listening conditions (See Table I).

At the other extreme, if the average of the hearing levels at 500, 1,000, 2,000 and 3,000 Hz. Is over 91.7 decibels, the impairment of hearing everyday speech is considered to be "total" - that is 100%. Variable degrees of monaural hearing loss will be determined by computation (see Table I - in JAMA - "Guides to the Evaluation of Permanent Impairment"). **

b) Evaluation of Binaural Hearing Impairment: The evaluation of Binaural Hearing Impairment in adults is also derived from the pure tone audiogram and is always based on the function of both ears.

Binaural impairment is determined by the following formula (See "Guides"). Percent of hearing impairment equals five times the percent of hearing impairment in the <u>better</u> ear "+" percent of hearing impairment in the poorer ear divided by six (See Table 2 of the Guides). To convert binaural hearing impairment to impairment of the whole person, one would utilize Table 3 of the "Guides".

IV. HEARING LOSS AT A LEVEL GREATER THAN 3,000 HZ

Hearing loss at a level greater than 3,000 Hz generally does not affect the workers' ability to function in the workplace (speech, telephone, etc.). Therefore,

hearing loss at this level is not addressed in the AMA Guides to the Evaluation of Permanent Impairment These losses should be classified by a Board Certified Otolaryngologist or Certified Audiologist as mild, moderate, severe or profound.

** Information concerning the mechanism of determination of extent of hearing loss in relationship to workplace injury has been derived from information provided by the JAMA Guides to the Evaluation of Permanent Impairment of Hearing (Pages 922-925 in section labeled Ear, Nose, and Throat and related structures).

PROTOCOL HISTORY:

Passed: 6/29/2000
Effective:7/20/2000

INITIAL MEDICAL CASE MANAGEMENT PROTOCOL GUIDELINES

The purpose of medical case management is to provide a systematic approach for identifying and coordinating quality medical care. While advocating for the injured worker, the medical case manager will conduct an assessment and will work as a liaison in planning, implementing and evaluating on-going medical care as recommended by the treatment team. The ultimate goal of medical case management is to facilitate maximum medical recovery.

1. An Initial Medical Case Management Assessment must be provided by a Qualified Rehabilitation Counselor (QRC) or Qualified Rehabilitation Counselor Intern (QRCI) as certified by the RI Department of Labor and Training.

2. Prior to the assessment, the medical case manager should review all available medical records and clarify the purpose of the referral with the referral source.

3. The initial interview will be conducted at a mutually agreeable location.

4. The medical case management assessment should include, but not be limited to, the following areas:

A. Statement of purpose for the assessment.
B. Diagnosis and reference to the average length of disability per the Presley Reed Disability Advisor or another nationally recognized disability guide.
C. Summary of medical providers and medical treatment to date.
D. Client’s present medical status including history of current illness or injury, relevant past medical history, description of functional limitations and abilities and current treatment plan as outlined by the treating physician.
E. Client’s social, educational and vocational history.

F. Review of client’s job description and potential availability of transitional duty through contact with the employer.

G. Identify assets and/or limitations for return to work.

H. Recommendations for medical management goals to facilitate the treatment plan and timely return to work.

5. The Initial Medical Case Management Assessment will be submitted to the referral source within two (2) weeks of the initial interview.

Protocol History:
Passed: 5/29/01
Effective:6/19/01

INITIAL VOCATIONAL ASSESSMENT PROTOCOL GUIDELINES

The purpose of the Initial Vocational Assessment protocol is to establish standard practices for a vocational assessment through the application of consistent procedures including the hierarchy of vocational rehabilitation as defined in Appendix A. The goal of a vocational assessment is to objectively measure an injured worker's employability to identify realistic return to work opportunities and to develop appropriate vocational recommendations based on the individual's functional status, education, and vocational background and transferable skills. Progression in the hierarchy of vocational rehabilitation is a sequential process based on the injured worker's functional status, transferable skills, and established average weekly wage. It is presumed that each level of the hierarchy will be addressed when establishing vocational recommendations.

1. An Initial Vocational Assessment must be provided by a Qualified Rehabilitation Counselor (QRC) or Qualified Rehabilitation Counselor Intern (QRCI) as certified by the RI Department of Labor and Training per Section 28-33-41(h) of the Rhode Island Workers' Compensation Act.

2. The initial interview may be conducted at a mutually agreeable meeting place.

3. The referral source will provide claimant-identifying data, medical records, including functional capacities, if available, as they pertain to the work-related injury, purpose of referral and special instructions, if any.

4. During the initial interview, the rehabilitation counselor should gather all relevant information to include, but not be limited to; current medical status, educational history, specialized training, military experience, vocational history, including job duties and wages, interests, and hobbies. The hierarchy of vocational rehabilitation will be explained to the injured worker at the time of the initial interview. One meeting

with the claimant will be allowed to complete the Initial Vocational Assessment.

5. A Transferable Skills Analysis should be completed provided that defined functional capacities are identified in the medical records and a return to work with the employer, to the original job (with or without modifications) has been ruled out. The Transferable Skills Analysis will be based on the following U.S. Department of Labor publications: D.O.T. (Dictionary of Occupational Titles), C.O.J. (Classification of Jobs), GOE (Guide for Occupational Exploration), SOC (Selected Characteristics of Occupations defined in the Dictionary of Occupational Titles) and the O*NET. Software programs based on these publications/references will be considered acceptable resources for completing the analysis.

6. Testing is not considered part of the Initial Vocational Assessment, but may be included as a recommendation.

7. The initial Vocational Assessment Report will address the following:

a. Purpose of the referral.
b. Brief summary of claimant’s medical history and current status, description of functional limitations and abilities, and any pending medical treatment.
c. Claimant’s education, specialized training and military experience.
d. Claimant’s vocational history, including wages and length of employment. DOT (Dictionary of Occupational Titles) numbers should accompany job titles held.
e. Results of the Transferable Skills Analysis, if completed.
f. Identification of assets and barriers as they relate to continued vocational rehabilitation services.
g. The hierarchy of vocational rehabilitation will be considered in establishing recommendations.

h. Recommendations.

8. The Initial Vocational Assessment report will be submitted within two (2) weeks of the initial interview.

APPENDIX A

HIERARCHY OF VOCATIONAL REHABILITATION

1. **Return to work, same employer, same job** - vocational services may include a job analysis and coordination to return to work with the employer, but usually no vocational services provided.

2. **Return to work, same employer, different job** - work with the employer to identify a new position that would fit the restrictions or modifications needed by the injured worker.

3. **Return to work, different employer, same job** - vocational services would assist in job development and placement.

4. **Return to work, different employer, different job** - vocational services may consist of performing a transferable skills analysis, interest testing, job development and job placement.

5. **On-the-job training** - identify a new employer that can train the injured worker on the job. This program can last between 3 months and 6 months.

6. **Skills enhancement** - vocational services may identify a course to develop a skill prior to a job search. This does not consist of a full retraining program.

7. **Retraining** - vocational assessment identifies that the above options are not feasible and then identifies a retraining program usually less than two (2) years in length. The training program can range from a short-term certificate program to a two (2) year associates degree program. Vocational services would probably include interest testing, transferable skills analysis, aptitude testing, labor market research and vocational exploration to support a training program.

Protocol History:
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OCCUPATIONAL HEARING IMPAIRMENT TREATMENT PROTOCOL

This Protocol addresses the treatment of hearing impairment that has been established as "work related" by a Board Certified Otorhinolaryngologist. Hearing impairment may be related to a single event, such as trauma or a basal skull fracture, or it may be related to exposure to excessive noise in the work place.

DEGREES OF HEARING LOSS

0 to 25 dB Normal

25 to 45 dB Mild

45 to 60 dB Moderate

60 to 75 dB Moderately Severe

75 to 90 dB Severe

Over 90 dB Profound

Reference should be made to the OSHA table for age-related hearing loss, data from which is attached hereto and made a part of this Protocol.

I. TREATMENT OPTIONS

A. A trial of aural rehabilitation, if indicated, usually in cases of mild loss if recommended by the otorhinolaryngologist.

B. A hearing aid may be prescribed for occupational hearing impairment related to exposure to excessive noise in the workplace as determined by an otorhinolaryngologist. The need for such will be determined by an otorhinolaryngologist, who has provided the testing and indicated that the loss is work-related and sufficient to require the use of a hearing aid. This hearing aid may be provided by an otolaryngologist.

C. A hearing aid may be prescribed for a monaural hearing loss, if recommended by an otorhinolaryngologist.

II. TYPES OF HEARING AIDS TO BE CONSIDERED

A. BTE (Behind the ear)

B. CIC (Completely in ear canal) This is only helpful in mild to moderate hearing loss and not in smaller angular canals.

C. ITC (In the canal) This is stronger than the CIC.

D. ITE (Inside the ear) This device is easier to adjust the volume.

III. HEARING AID CIRCUITRY

A. Analog, is basic and the oldest type.

B. Programmable.

C. Digital, which is state of the art.

D. Disposable hearing aids are not acceptable treatment.

E. Average life expectancy of a hearing aid is five (5) years.

IV. SURGERY

A. Cochlear implants; used in patients with hearing loss so extreme that the best hearing aid would have no effect.

B. Reconstructive surgery, for either traumatic abnormalities to the external ear canal, tympanic membrane, or middle ear.

C. A second opinion is required before surgical intervention may be performed.

Example of Age Correction; Text From:

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Frequency (Hz)

	1000	2000	3000	4000	5000
Age 32	6	5	7	10	14
Age 27	5	4	6	7	11
Difference	1	1	1	3	3

The difference represents the amount of hearing loss that may be attributed to aging in the time period between the baseline audiogram and the most recent audiogram. In this example, the difference at 4000 Hz is 3 dB. This value is subtracted from the hearing level at 4000 Hz, which in the most recent audiogram is 25, yielding 22 after adjustment. Then the hearing threshold in the baseline audiogram at 4000 Hz (5) is subtracted from the adjusted annual audiogram hearing threshold at 4000 Hz (22). Thus the age-corrected threshold shift would be 17 dB (as opposed to a threshold shift of 20 dB without age correction.)

Table F-1 - Age Correction Values In Decibels for Males

Years	Audiometric Test Frequencies (Hz) 1000	2000	3000	4000	6000
20 or younger	5	3	4	5	8
21	5	3	4	5	8
22	5	3	4	5	8
23	5	3	4	6	9
24	5	3	5	6	9
25	5	3	5	7	10
26	5	4	5	7	10
27	5	4	6	7	11
28	6	4	6	8	11
29	6	4	6	8	12
30	6	4	6	9	12
31	6	4	7	9	13
32	6	5	7	10	14
33	6	5	7	10	14
34	6	5	8	11	15
35	7	5	8	11	15
36	7	5	9	12	16
37	7	6	9	12	17
38	7	6	9	13	17
39	7	6	10	14	18
40	7	6	10	14	19
41	7	6	10	14	20
42	8	7	11	16	20
43	8	7	12	16	21
44	8	7	12	17	22
45	8	7	13	18	23
46	8	8	13	19	24
47	8	8	14	19	24
48	9	8	14	20	25
49	9	9	15	21	26
50	9	9	16	22	27
51	9	9	16	23	28
52	9	10	17	24	29
53	9	10	18	25	30
54	10	10	18	26	31
55	10	11	19	27	32
56	10	11	20	28	34
57	10	11	21	29	35
58	10	12	22	31	36
59	11	12	22	32	37
60 or older	11	13	23	33	38

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Table F-2 - Age Correction Values in Decibels for Females

Years	Audiometric Test Frequencies (Hz) 1000	2000	3000	4000	6000
20 or younger	7	4	3	3	6
21	7	4	4	3	6
22	7	4	4	4	6
23	7	5	4	4	7
24	7	5	4	4	7
25	8	5	4	4	7
26	8	5	5	4	8
27	8	5	5	5	8
28	8	5	5	5	8
29	8	5	5	5	9
30	8	6	5	5	9
31	8	6	6	5	9
32	9	6	6	6	10
33	9	6	6	6	10
34	9	6	6	6	10
35	9	6	7	7	11
36	9	7	7	7	11
37	9	7	7	7	12
38	10	7	7	7	12
39	10	7	8	8	12
40	10	7	8	8	13
41	10	8	8	8	13
42	10	8	9	9	13
43	11	8	9	9	14
44	11	8	9	9	14
45	11	8	10	10	15
46	11	9	10	10	15
47	11	9	10	11	16
48	12	9	11	11	16
49	12	9	11	11	16
50	12	10	11	12	17
51	12	10	12	12	17
52	12	10	12	13	18
53	13	10	13	13	18
54	13	11	13	14	19
55	13	11	14	14	19
56	13	11	14	15	20
57	13	11	15	15	20
58	14	12	15	16	21
59	14	12	16	16	21
60 or older	14	12	16	17	22

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Diagnostic and Initial Treatment Of Occupational Asthma

I. Background:

A. Asthma is an airways disease of the lungs characterized by the following:
1. Airway inflammation
2. Increased airway responsiveness to a variety of stimuli; and
3. Airway obstruction that is partially or completely reversible, either spontaneously or with treatment.

The two essential *clinical* elements for the diagnosis of asthma are airways obstruction which is partially or totally reversible with treatment, and/or airways hyperreactivity. *Occupational asthma* is asthma that has its onset in association with workplace exposure(s). *Occupationally – aggravated asthma* is asthma that is aggravated by workplace exposure(s).

B. Causative agents are classified as sensitizers (including but not limited to the appended list) or irritants. Sensitizers cause inflammation through one or more immunologic mechanisms, whereas irritants directly inflame the airway. Occupational environments are often complex, and it may be difficult to identify a single specific causal agent.

C. A delay in diagnosis resulting in continued exposure of the worker to even minute amounts of sensitizers can lead to permanent and irreversible airways disease or *death.*

D. An acute high level inhalation exposure to an irritant may result in a permanent asthmatic condition known as Reactive Airways Dysfunction Syndrome (RADS).

E. This guideline is meant to cover the majority of tests and treatments that may be used to diagnose and initially stabilize occupational and occupationally-aggravated asthma. **This guideline does not include parameters of care for long term management of either occupational or occupationally-aggravated asthma.** It is expected that approximately 10% of cases will fall outside this guideline and require review on a case-by-case basis.

II. Criteria for Diagnosis:

A. Diagnosis of Occupational Asthma

1. Diagnosis of asthma within these guidelines by a medical doctor, using the appended algorithm.
2. Historical association between the onset of asthma and work,
AND
3. At least one of the following criteria:

a. Documentation (see Occupational History, Section III.B) of workplace exposure to a category of agents or processes associated with asthma;
b. Work-related change in FEV1 or in peak expiratory flow (PEF);
c. Onset of respiratory signs and/or symptoms within hours after an acute high level occupational inhalation exposure to an irritant (RADS)

B. Diagnosis of Occupationally-Aggravated Asthma: There must be a history of asthma prior to the occupational exposure in question. Other diagnostic criteria are the same as for new onset occupational asthma.

III. Medical Diagnosis and Initial Stabilization:

Physician Visits Allowed. The number of physician visits needed to diagnose and stabilize cases of occupational and occupationally-aggravated asthma is likely to vary from patient to patient. Physicians must use their judgment to determine the number of physician visits necessary for diagnosis and initial stabilization.

IV. Establishing the Diagnosis:

A. Medical History:

1. Characteristic symptoms: wheeze, cough, chest tightness, shortness of breath.
2. Past respiratory history: prior diagnosis of asthma, allergies, eczema, rhinitis, bronchitis, sinusitis, hayfever, chest colds, and respiratory symptoms upon exertion, exposure to minor irritants, or exposure to cold air.
3. Review of systems: history of other diseases with symptoms that could mimic or precipitate asthma; e.g., cardiovascular disease with left ventricular dysfunction; gastroesophageal reflux.
4. Family history: asthma, atopy.

5. Smoking history: average # packs of cigarettes per day x # years smoked (pack years of smoking).
6. List of current medications.
7. Home, hobby, and environmental exposure history to exclude other causal or contributing factors.

B. Occupational History:

1. Description of the patient's work tasks, exposures and related processes, both past and present.
2. Effect(s) of workplace exposures on respiratory symptoms, with emphasis on temporal associations. Note whether symptoms change on weekends and/or vacation.
3. Documentation of workplace exposures where possible: e.g., Material Safety Data Sheets (MSDS); employer records; industrial hygiene monitoring data from government agencies or private consultants.
4. Where data for characterizing exposures is inadequate, worksite evaluation by an appropriate health care provider or industrial hygienist may be necessary and is encouraged.

C. Physical Examination:

1. Examination of head for rhinitis, nasal polyps, conjunctivitis, and sinusitis.
2. Chest percussion and auscultation.
3. Cardiovascular exam to rule out cardiogenic explanation for respiratory symptoms.
4. Skin exam for atopic dermatitis.

D. Diagnostic Tests Allowed:

1. A total of 11 spirometry *studies* is allowed. For purposes of this guideline, each *study* shall consist of a minimum of 3 and a maximum of 8 *maneuvers*, with at least the initial study pre- and post-inhaled bronchodilator.

    a. Up to 2 follow-up spirometry studies will be allowed to establish a diagnosis of asthma.
    b. Up to 8 pre- and post-shift spirometry studies will be allowed at the beginning and end of each work week for 2 weeks.
    c. When PEF diary and spirometric monitoring are equivocal, a longer absence from work may be needed to establish or rule out the diagnosis, with

(i) 1 repeat spirometry study allowed at the beginning of the absence from work and 1 repeat spirometry study allowed at the end of the absence from work, and
(ii) the PEF diary monitoring repeated.

2. One Non-Specific Inhalation Challenge Test Allowed:
If there is no significant improvement in FEV1 in response to inhaled bronchodilator, and *if* the existence of airways hyperreactivity remains in question (see appended algorithm), but *only* when:

a. Performed in a Hospital-based Outpatient Setting,
b. Consistent with this guideline's Appended Algorithm, and
c. Under Supervision of a medical doctor experienced in this type of procedure.

3. Ten Specific Skin Tests with relevant antigens allowed, but *only* when:

a. Performed by a Medical Doctor Experienced in this type of Procedure and,
b. In a hospital-based outpatient setting.

WARNING: SKIN TESTS ARE NON-EMERGENT PROCEDURES, WITH SIGNIFICANT RISK OF SEVERE REACTION, INCLUDING DEATH.

4. Chest radiograph – 1 postero-anterior and 1 lateral view allowed.
5. Latex and laboratory animal dander RAST test(s) for specific work-related exposure – 1 allowed for each antigen.

V. Initial Treatment Program:

A. Prevention of further exposure to causal or precipitating agent(s):

1. When caused by a sensitizing agent, all further exposure to the causal agent must be eliminated because of the increased risk for irreversible airways obstruction, severe bronchospasm and/or *death*. A statement of the physician's discussion of these and other risks with the patient must be documented in the medical record.
2. When caused by an irritant, elimination of exposure is desirable but significant reduction of exposure may be sufficient. When elimination of exposure is not possible, alternative approaches may

include, in order of preference:

a. Engineering controls such as local exhaust ventilation

b. Appropriate use of respiratory protection provided by the employer

B. Where these approaches fail and the clinical condition warrants, removal of the workers from the workplace may be necessary.

C. Medications:

1. Medications should only be used in conjunction with prevention of further exposure as outlined in Section V. A. above.

2. Spirometric testing is allowed as needed to monitor effectiveness of therapy, not to exceed a maximum of 11 spirometry studies allowed in Section IV. D. above. Due to its unique nature, Occupational Asthma often requires a more aggressive therapeutic approach than Non-Occupational Asthma. The recommended therapeutic approach is as follows:

a. Step 1: Rapid-onset *B*-agonist as needed for control of symptoms of asthma occurring less than three times per week. If this fails, then:
b. Step 2: Inhaled low-to-medium dose corticosteroids to treat underlying inflammation, combined with a rapid-onset inhaled *B*-agonist as needed to control symptoms of asthma. If this fails, then:
c. Step 3: Increase inhaled corticosteroids to high dose, plus long-acting inhaled *B*-agonist, and/or oral *B*-agonist and/or theophylline with continued use of rapid-onset inhaled *B*-agonist as needed to control symptoms of asthma. If this fails, then:
d. Step 4: Add an oral corticosteroid.

D. Patient Education (The following shall be discussed with the patient at the initial physician visit and repeated thereafter as necessary):

1. Key points about signs and symptoms of asthma and characteristic airway changes in asthma.
2. Asthma triggers and how to avoid them.
3. How medications work and their potential adverse effects; instruction and demonstration in the correct use of all medications (e.g., proper use of MDIs).
4. Techniques of monitoring status of asthma, such as PEF readings.
5. Indications for emergency care.

VI. Discharge Plan:

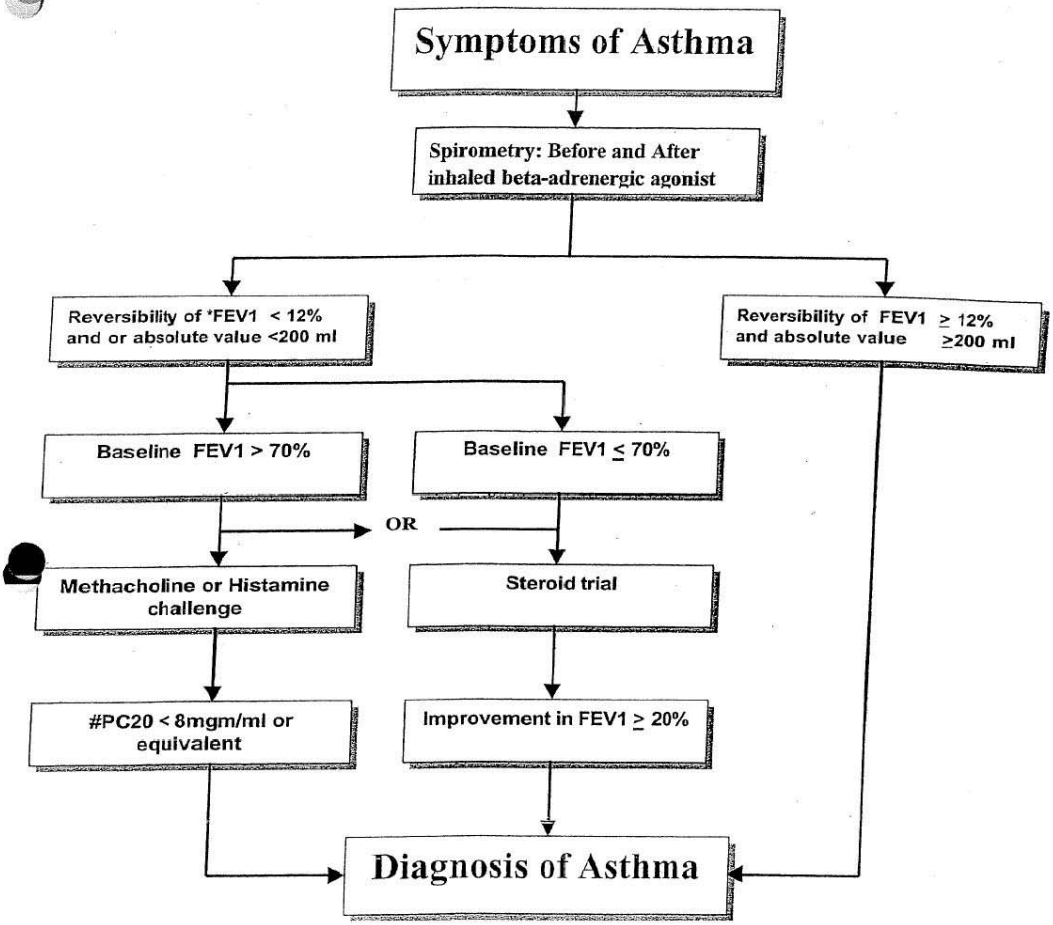
A. Future medical care will depend upon the outcome of initial medical management. This guideline is meant to address only the diagnosis and initial stabilization of occupational and occupationally-aggravated asthma.

B. If causal or aggravating exposure is eliminated or reduced and asthma symptoms resolve without medication, no further medical management is needed. If symptoms have resolved with medication, a period of medical follow-up will be needed to determine the necessity for continued medication and to establish an effective maintenance regimen. Practitioners should consult other guidelines, practice parameters and/or standards of care for guidance in the long-term management of persistent symptoms of asthma.

Protocol History:

Passed: April 20, 2004
Effective: May 11, 2004

DIAGNOSIS OF ASTHMA ALGORITHM



FEV1 = Forced Expiratory Volume in one second
#PC20 = Provocative concentration to cause a 20% decline in FEV1

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OCCUPATIONAL ASTHMA CAUSING AGENTS:
*List of Known Sensitizers as of 6/5/97**

Organic Chemicals

Acrylates
Methyl methacrylate, cyanoacrylates
Ethylcyanoacrylate ester
Plexiglass

Alcohols
Furfuryl alcohol (furan based resin)
Alkylaryl polyether alcohol, polypropylene glycol
(combination)

Aldehydes
Formaldehyde
Glutaraldehyde
Urea formaldehyde

Aliphatic Amines:
Ethylene diamine
Hexamethylene tetramine
Triethylene tetramine

Aliphatic Amines: Ethanolamines
Monoethanolamine
Aminoethylethanolamine
Dimethylethanolamine

Anhydrides
Phthalic anhydride
Trimellitic anhydride
Tetrachlorophthalic anhydride
Pyromellitic dianhydride
Methyl tetrahydrophthalic anhydride
Himic anhydride

Amines, Aliphatic: Other
3-(Dimethylamino)-propylamine

Amines, Heterocyclic
Piperazine hydrochloride
N-methylmorpholine

Amines: Other
Chloramine T

Aromatic Hydrocarbons, NOS
Styrene

Azo Compounds
Azodicarbonamide
Diazonium salt
Azobisformamide

Chlorinated Compounds
Chlorhexidine

Fluorinated Compounds
Freon

Isocyanates
Toluene Diisocyanate
Diphenylmethane diisocyanate
1,5 Naphthylene diisocyanate
Isophorone diisocyanate
TDI, MDI, HDI, PPI (combination)
TDI, MDI, HDI (combination)
TDI, MDI (combination)

Phenols
Hexachlorophene

Polymers
Latex, synthetic
Polyvinyl chloride (fumes or powder)

Sulphonates
Iso-nonanyl oxybenzene sulphonate

Inorganic Chemicals

Metals
Aluminum
Chromium and Nickel (combination)
Cobalt and Nickel
Platinum
Nickel
Zinc fumes
Tungsten carbide
Chromium

Nonmetallic Elements
Fluorine

Miscellaneous Chemicals

Pharmaceuticals
Penicillins and Ampicillin
Penicillamine
Cephalosporins
Phenylglycine acid chloride
Psyllium
Methyl dopa
Spiramycin
Salbutamol intermediate
Amprolium
Tetracycline
Isonicotinic acid hydrazide
Hydralazine
Tylosin tartrate
Ipecacuanha
Cimetidine
Rose Hips

Dyes
Levafix brilliant yellow E36
Drimaren brilliant yellow K-3GL
Cibachrome brilliant scarlet 32
Drimaren brilliant blue K-BL
Persulphate salts and henna
Reactive dyes

Fluxes
Colophony
Zinc chloride, ammonium chloride (mixture)
Alkylaryl polyether alcohol, polypropylene glycol
(combination)
Pylene glycol

Miscellaneous Chemicals, NOS
Tetraxzene
Oil mist

Biological Agents

Animal/Animal Materials
Laboratory animal
Egg protein (Egg producers)
Chicken
Pig
Frog
Lactoserum
Casein (cow's milk)
Bat guano

Fish/Fish Materials
Crab
Prawn
Hoya
Cuttle-fish
Trout
Shrimpmeal
Fish-feed, Echinodorus lava
Red soft coral

Insect/Insect Materials
Grain mite
Locust
Screw Worm Fly
Cricket
Bee moth
Moth
Butterfly
Mexican bean weevil
Fruit fly
Honeybee
L. Caesar larvae
Lesser mealworm, (Grain and poultry workers)
Fowl mite, (Poultry workers)
Barn mite, (Farmers)
Parasites (Flour Handlers)
Mites, (Flour Handlers)
Acarian, (Apple Growers)
Daphnia, (Fish food store)
Weeping Fig, (Plant Keepers)
Sheep Blowfly, (Technicians)

Biological Agents, con't
Larva of Silkworm

Plants/Plant Material
Grain dust
Wheat, Rye
Soya Flour
Lathyrus sativus
Vicia sativa
Buckwheat
Gluten
Coffee bean
Caster bean
Tea
Herbal Tea
Tobacco Leaf
Hops
Baby's Breath
Freesia
Paprika
Mushroom
Cacoon seed
Chicory
Sunflower
Garlic dust
Lycopodium
Sericin
Nacre dust
Henna

Vegetable Gums
Gum, Acacia
Gum, Tragacanth
Gum, Guar
Latex, natural rubber

Wood Dust or Bark
Western red cedar, (Thuja plicata)
California redwood, (Sequoia sempervirens)
Cedar of Lebanon, (Cedra Libani)
Cocabolla, (Dalberqia retusa)
Iroko, (Chlorophora excelsa)
Oak, (Quercus robur)
Mahogany, (Shoreal Sp)
Abiruana, (Pouteria)
African Maple, (Triplochiton scleroxylon)
Tanganyika aningre
Central American Walnut, (Juglans olanchana)
Kejaat, (Pterocarpus angolensis)
African zebrawood, (Microberlinia)
Ramin, (Gonystylus bancanus)
Quillaja bark
Fernambouc, (Caesalpinia echinata)
Ashwood, (Fraxinus americana)
Eastern red cedar, (Thuja occidentalis)
Ebony wood, (Disospyros crassiflora)
Kotibe wood, (Nesorgordonia papverifera)
Cinnamon, (Cinnamomum Zeylanicum)

Biologic Enzymes

B.subtilis
Trypsin
Papain
Pepsin
Pancealin
Flaviastase
Bromelin
Fungal amylase
Fungal amyloglucosidade
Fungal hemicellulase
Esperase

*Adapted from: Chan-Yeung M. Malo JL. Aetiological Agents in Occupational Asthma. European Respiratory Journal. 1994. Vol.7. pp.346-371.

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***# PC20** = Provocative concentration to cause a 20% decline in FEV1*